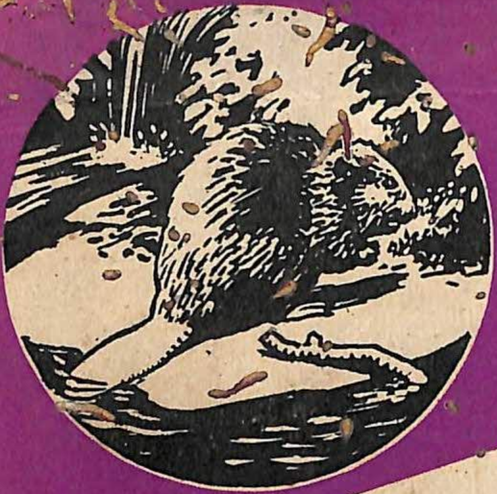
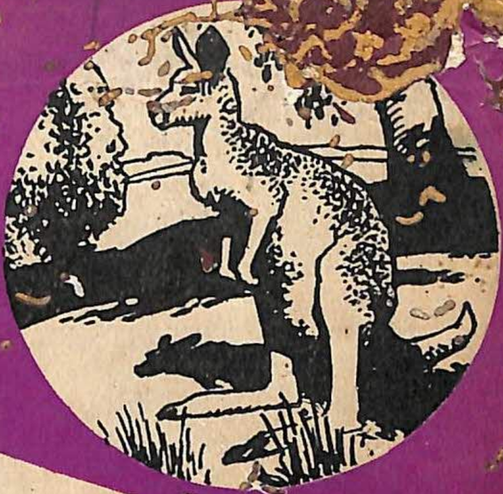




1054

ANIMALS OF THE WORLD

EDWARD OSMOND

Series 2

591.9
Osm

ANIMALS OF THE WORLD

Each story is obtainable separately:

Manilla cover, each 1s. 9d.
Picture cover, each 2s. net

ELEPHANTS
CAMELS
POLAR BEARS
CHIMPANZEES
KANGAROOS
REINDEER
BEAVERS
WHALES
*LLAMAS
*LIONS

*In linson covers, each 2s.

Price (in U.K. only

7s. 6d. net

7 s. 6d.

ANIMALS OF THE WORLD

ANIMALS OF THE WORLD

SERIES I

Elephants
Camels
Polar Bears
Chimpanzees

SERIES II

Kangaroos
Reindeer
Beavers
Whales

Further books in preparation

Each title is obtainable separately as well as in books of four

ANIMALS
OF THE WORLD

by
EDWARD OSMOND

SERIES II

591.9
Osm

INSTITUTE OF EDUCATION FOR WOMEN
1654
Dept. of Extension
SERVICE.
CALCUTTA-27

OXFORD UNIVERSITY PRESS

CONTENTS OF SERIES II

KANGAROOS

REINDEER

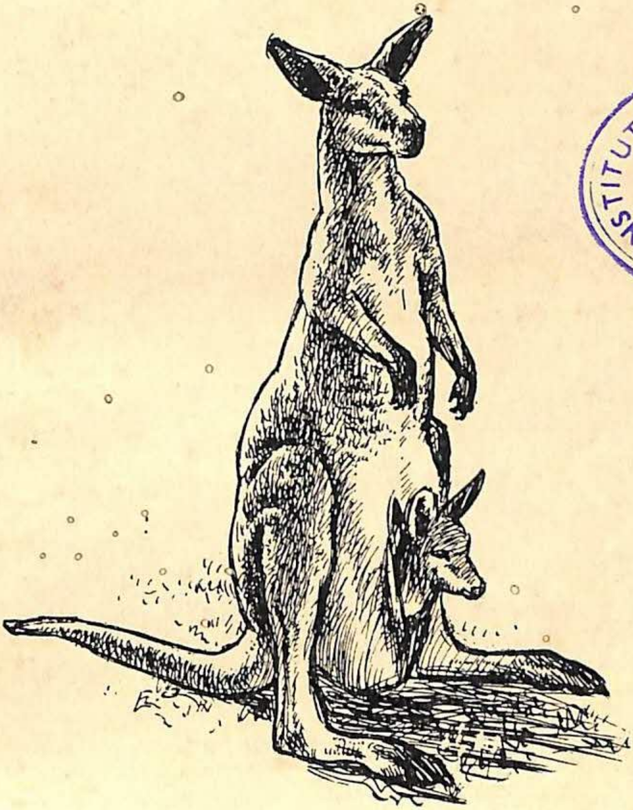
BEAVERS

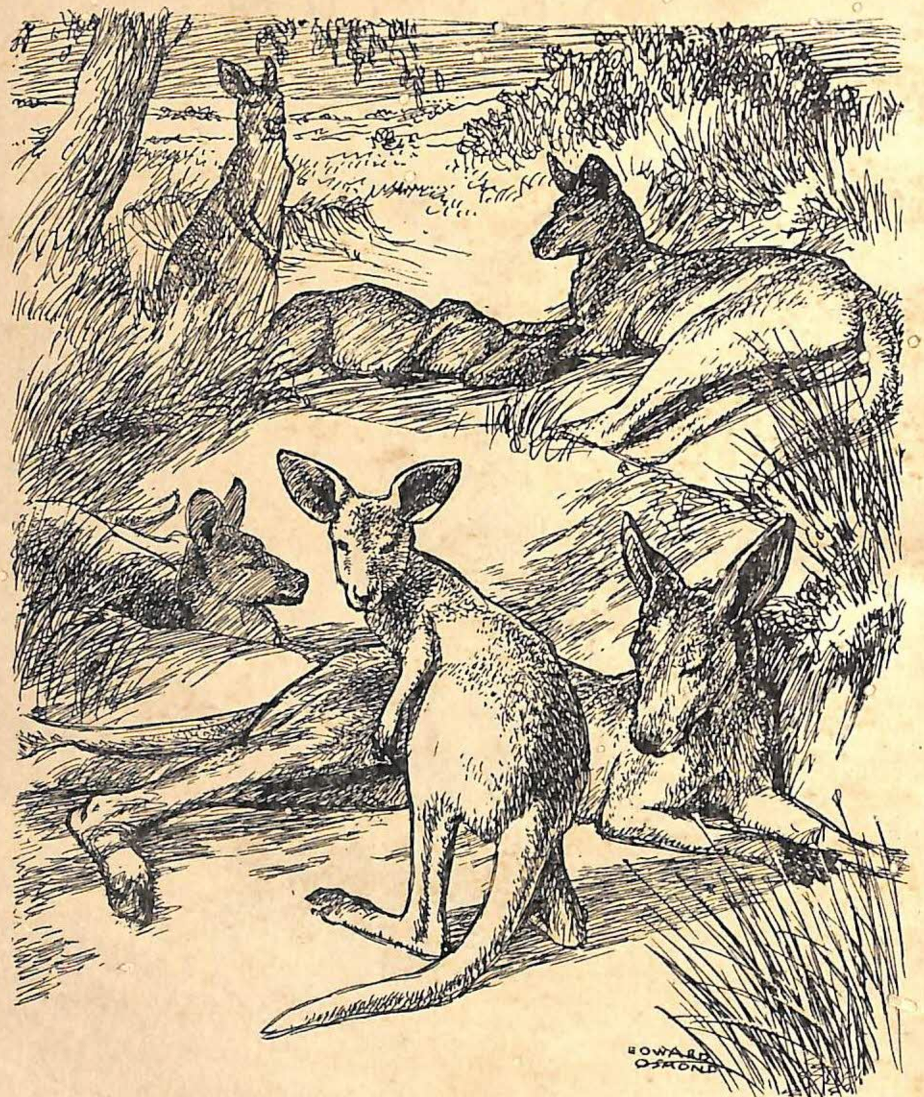
WHALES

Printed in Great Britain by Richard Clay and Company, Ltd.,
Bungay, Suffolk

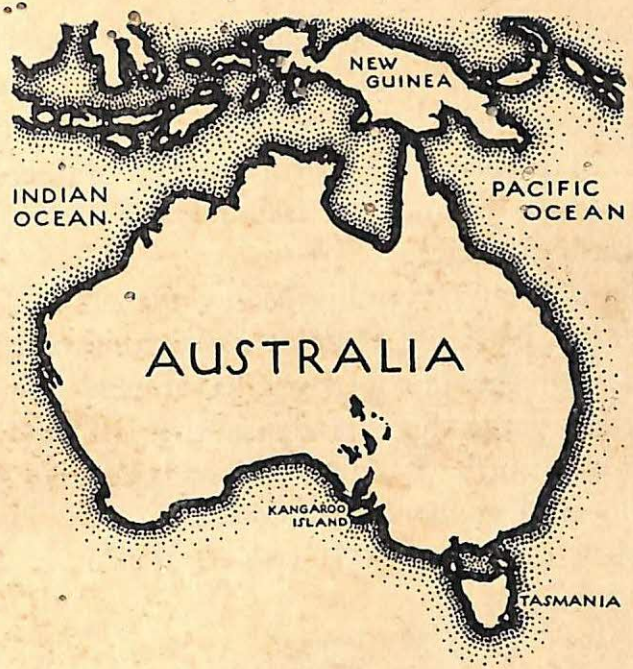
KANGAROOS

INSTITUTE OF EDUCATION FOR WOMEN
Dept. of Extension
SERVICE.
CALCUTTA-27





A SMALL MOB OF RED KANGAROOS RESTING AT MIDDAY



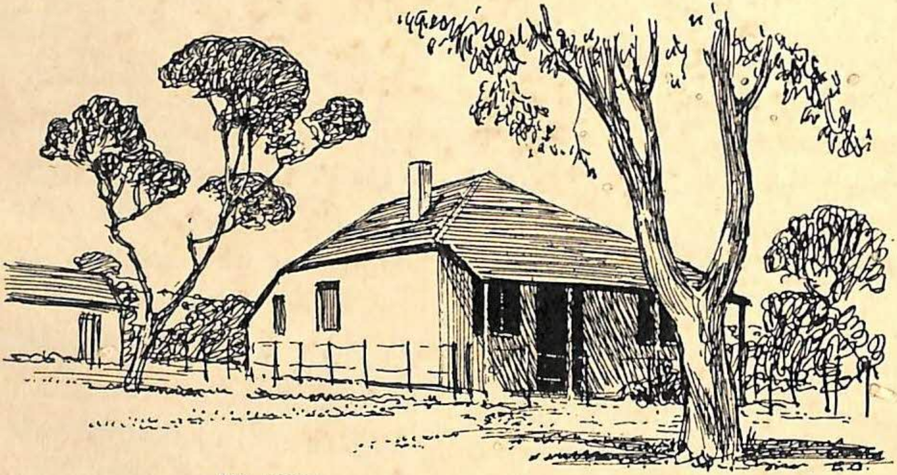
AUSTRALIA AND NEIGHBOURING ISLANDS

KANGAROOS

OF all the countries in the world Australia has some of the strangest animals, many of them quite unlike the animals of other countries. Many of the animals of Australia have the habit of carrying their babies in pouches to keep them safe. Animals with pouches are called ‘ marsupials ’. Some of these are tiny creatures, no bigger than a mouse; but the largest and best known of them, the kangaroos, are often, when they stand up, taller than a man. Some marsupials live all the time in trees, while others burrow holes in the ground. Some eat the flesh of other animals, but most live on grass or the leaves of trees. Marsupials are hardly found anywhere else except in Australia and the islands near Australia, and also in South America.

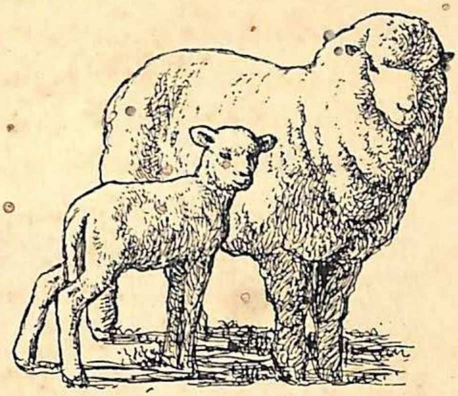
Australia is itself a very big island, the largest island in the world. It is so big that we call it one of the seven continents. In the north Australia is very hot indeed, and in some parts there is dense tropical forest. The islands to the north of Australia, such as New Guinea, are also hot and covered with forest.

The south of Australia is cooler, for since Australia



AN AUSTRALIAN FARMER'S BUNGALOW

lies to the south of the equator, the farther south one travels the cooler it grows. In some parts of southern Australia there is plenty of rain, and the farmers can grow corn and other good crops.

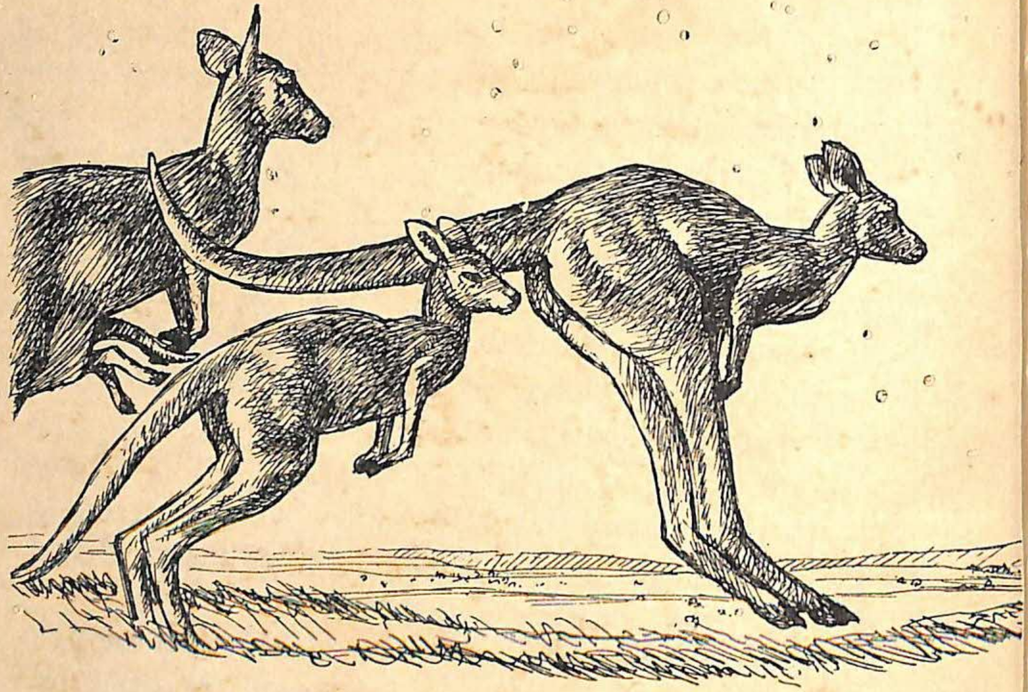


AUSTRALIAN SHEEP

In the centre of Australia there are large stretches of hot, dry, barren desert, with hardly any plants at all. In some parts one can travel for miles without seeing a single green plant of any kind—nothing but sand and stones.

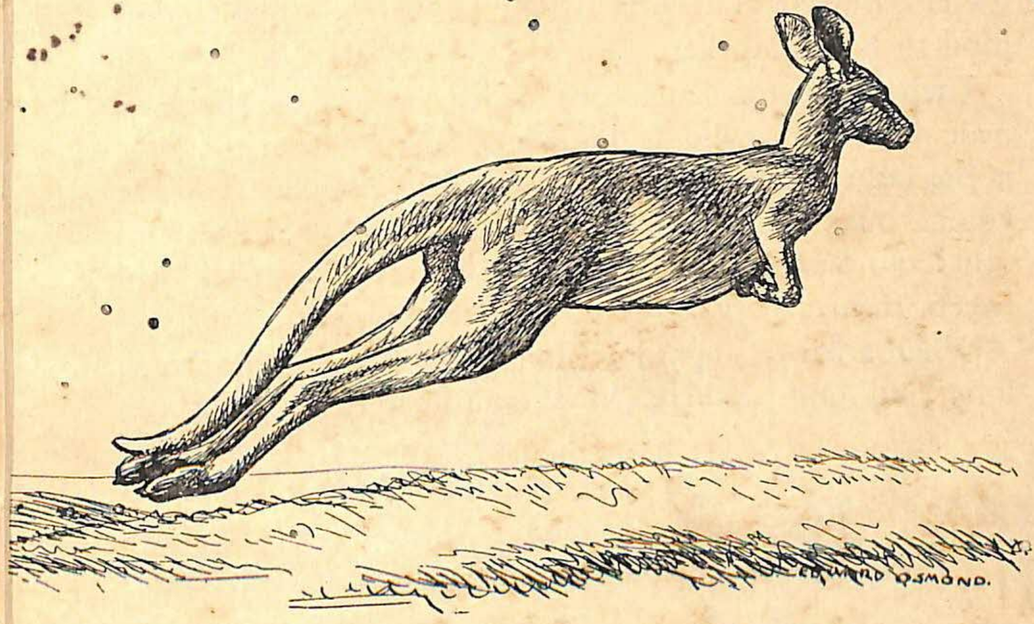
But in some parts of central Australia there is enough rain to allow grass to grow; and in those places sheep and cattle can find enough to eat. Most of this land is divided up into scattered farms, and the farmers put fences round their land to make enormous great fields, called 'paddocks'.

This grassland in central Australia is the home of the big red kangaroo, the best known of all the kangaroo family. Kangaroos have small heads and very short front legs, but their hind legs and their tails are very long and powerful. They do not run on all fours as other animals do; they hop along on their strong back legs,



RED KANGAROOS

with their tails stretched out behind to balance them. Kangaroos can hear and smell things from a long way off. They can also see a great distance, but, as their eyes are set on the sides of their heads, they cannot see very well straight in front of them. Kangaroos mainly live on grass, but they eat almost any kind of green plant. They make no particular home of their own, such as a nest or den, as many animals do; though they do have their favourite resting places for the hot, middle


EDWARD OSMOND.

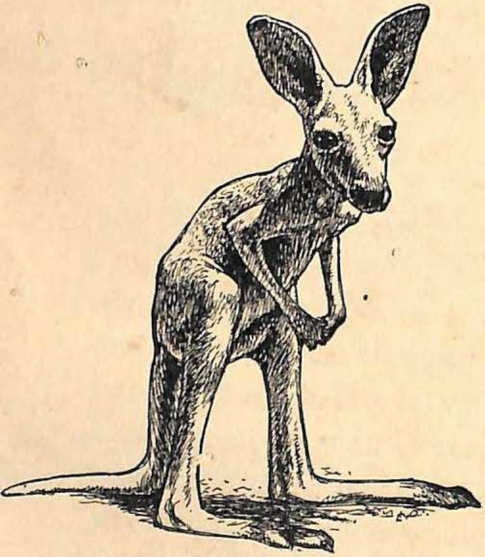
TRAVELLING AT SPEED

part of the day, and these are sometimes called kangaroos' nests.

Red kangaroos live together in small family parties, each party usually keeping to its own district. But in the hot, dry weather, when the grass has died down and food is scarce, they often have to wander great distances in search of food and water. Sometimes, during a heat wave, a thunderstorm will water the ground in a certain place and make the grass grow green there, when the rest of the land is still parched. Then the kangaroos will travel from far and near to take advantage of the good food to be found there.

Each family of kangaroos is led by a large buck, a male kangaroo, who is known as the 'old man'. He is the father of the family, and he rules his wives and the young bucks very strictly. He will fight fiercely with other old-man kangaroos to keep his own wives or win others from his rivals.

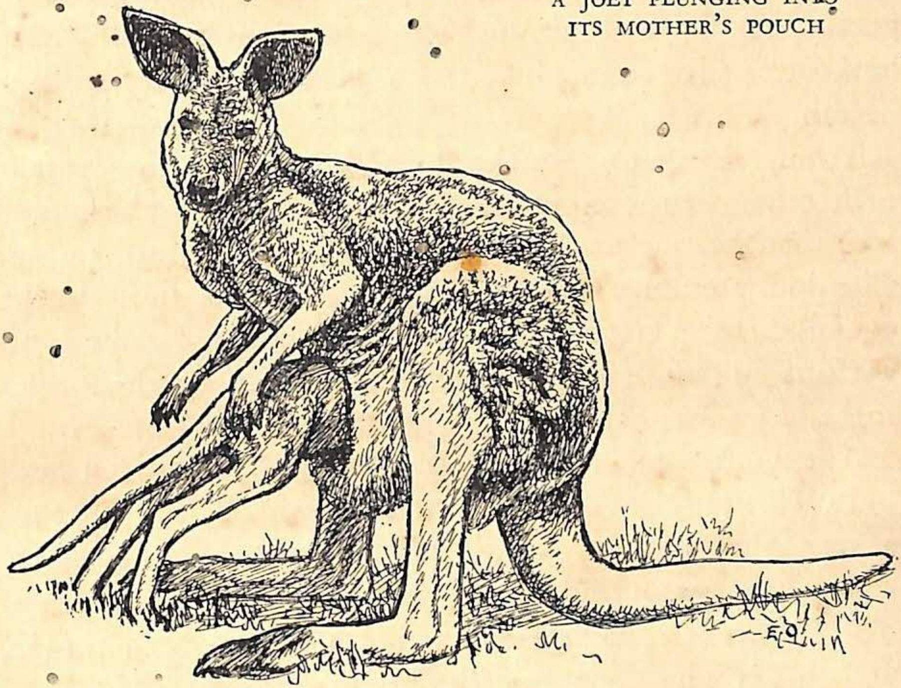
When a baby kangaroo is born it is only about an inch long and quite naked, blind, and helpless. All it can do for itself is to breathe and to climb through fur. It climbs through its mother's fur into her pouch, and there it stays for about 4 months. The mother kangaroo keeps her pouch closed at first, and then after some weeks she lets her baby put his head out and look around, and then he begins to nibble the grass as his mother moves through it. A young kangaroo is called a 'joey'.



A HALF-GROWN JOEY

When the joey is strong

A JOEY PLUNGING INTO
ITS MOTHER'S POUCH



enough, his mother lets him come out of her pouch for a little while, and he tumbles about in a very comical and clumsy way on his long, spindly legs. But he soon learns to control his legs and to hop about quite well. Even when he is quite large, he will hop back to his mother when there is danger. She turns towards him so that he can plunge into her pouch head-first, and then she bounds away, often with his long legs and tail still sticking far out from her pouch. Soon the joey gets too heavy for his mother to carry; then he must look after himself, and keep up with the family as best he can.

Young kangaroo bucks love boxing. They punch each other with their paws, boxing for about 3 minutes, and then resting for 3 minutes before the next round. The does are never as rough as this; but the young bucks and does of a family often play wild chasing games and perform all kinds of wonderful acrobatics on their hind legs.

The young bucks are at first grey, like the females; but each time they change their coat, which they do twice a year, they become a little redder until, when they are about two years old, their coat gains its full redness. The full-grown bucks are usually a deep foxy-red colour, and this is why they are called red kangaroos.

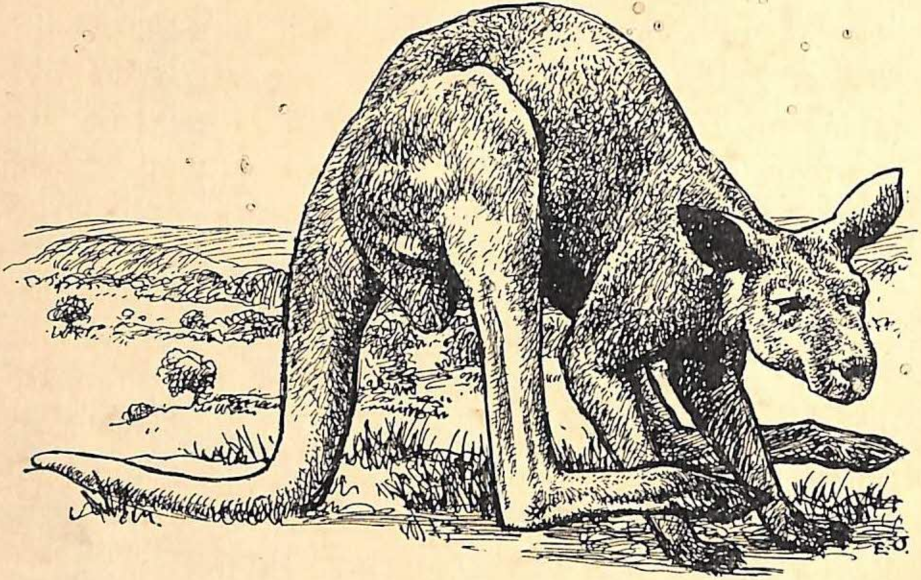
Young buck kangaroos stay with their family until they are full-grown. They are kept very much in order by the old man. But when they are grown-up they either have to fight him to become the leader of the family, or they must go off on their own.

Full-grown buck kangaroos fight seriously and very savagely. A fighting kangaroo stands up on the tips of his toes, and leans back on to his tail. He pushes his chest out and looks as fierce as he can. He may strike at his enemy with his front paws, but usually he grabs his opponent close and then tries to bite him. But he is most dangerous when he fights with his great hind feet; for a stab from these strong, steely claws is like the thrust of a sword. He will sometimes kick upwards with both feet at once, using his strong tail to support him, and in this way a large buck can kill his enemy with one blow.

AN OLD MAN RED KANGAROO
IN FIGHTING ATTITUDE

Buck kangaroos go on growing bigger all their lives. When they stand on their toes, red kangaroo bucks are usually about 6 feet high, but an old one may grow to be well over 7 feet high. People think that kangaroos can live for as long as sixteen years.

Female kangaroos are called does. They are much smaller than the bucks, and not at all like them; instead of being red they are usually a beautiful bluish grey. They are very lively, usually a good deal more active than the bucks, and for this reason they are often called ‘ blue



A KANGAROO MOVING FORWARD SLOWLY, SUPPORTED ON TAIL AND FRONT FEET WHILE SWINGING ITS HIND LEGS FORWARD

flyers'. In some parts of Australia, however, the bucks and the does are much more like each other. Sometimes there is so little difference either in colour or size that it is not always easy to tell which are bucks and which are does.

Kangaroos when they move usually hop on their hind legs, taking great leaps. But when a kangaroo is feeding he wants to creep forward slowly from one patch of grass to another; so he places his little front paws on the ground, and, with his weight balanced between them and his tail, he swings his large hind legs forward about 3 feet at a time. Most of the time, however, a kangaroo holds his front feet close in under his chest. He uses his front feet rather like hands, holding his food in them, just as a squirrel does, and pulling down the branches of trees and bushes with them.

Kangaroos keep themselves very clean. When they get up from their midday rest, they usually spend a long time grooming themselves. They lick their fur and comb it with the sharp claws of their little front feet. Then, when they are spick and span, the old man leads his family off to their feeding-grounds, where they have their evening meal as the sun goes down. They feed again at about sunrise; but before the day grows really hot they follow the old man back to their dust-bath nests in the shade of some trees. There they rest and doze until late afternoon. But even when they are resting they are always ready to bound off at any moment if there is danger. When they are being hunted the old man goes last of all to protect his family.

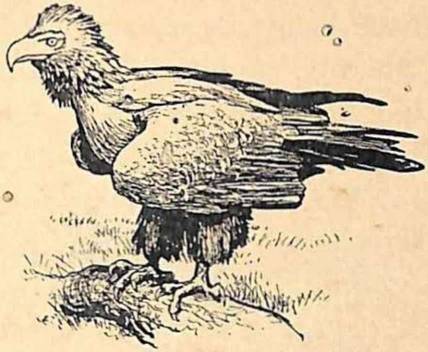
When a kangaroo is angry he makes a hoarse grunt, rather like a cough. But when he wants to warn his family of danger, he thumps loudly on the ground with a blow of his great hind foot.

Kangaroos can usually escape from their enemies by leaping away, for they can hop very fast indeed; an old man kangaroo can travel about 20 miles in two hours when he is being pursued by hunters, though he does not like to move so fast. Kangaroos take large and small hops to suit the kind of ground they are travelling over. When they are moving quickly, they leap about 5 feet, but it is possible for them to hop more than 25 feet at one bound. They can also jump high in the air. A kangaroo has been known to jump as high as 9 feet, though usually a 5-foot fence is enough to stop them.

A DINGO

Kangaroos have many enemies. The fiercest is the dingo, a kind of wild dog. Pure dingoes are a golden-yellow colour, with pointed ears and white tips to their bushy tails; but dingoes which have mixed with other dogs can be any colour from black to nearly white. Dingoes have very sharp teeth and strong jaws, and they hunt in pairs or in small family packs.

The wedge-tailed eagle is another enemy of the kangaroos. This is the largest

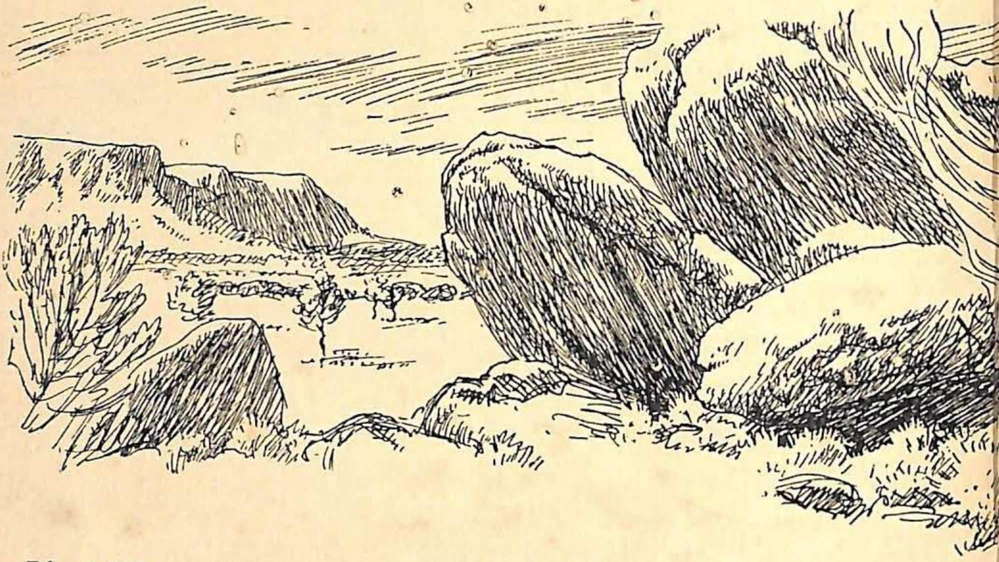


A WEDGE-TAILED EAGLE

eagle in the world, and is very strong and savage. It is not big enough to attack single-handed a full-grown red kangaroo, but two eagles together will often attack a doe kangaroo with a half-grown baby. The great birds swoop down on them again and again to try to frighten the young kangaroo away from his mother; once they have done this they can easily kill the baby.

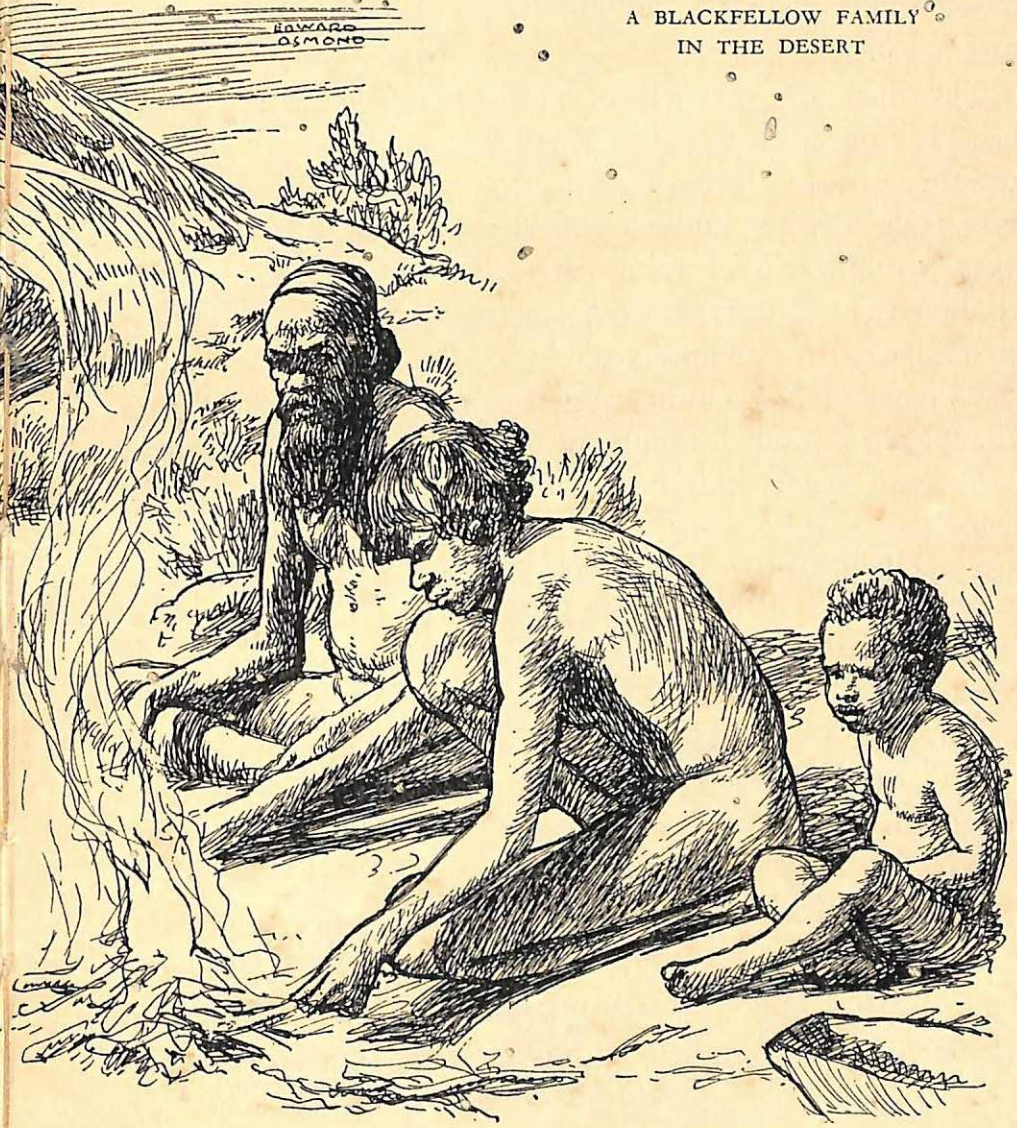
The tiny sandflies that hide in the sand and mud near the drinking-places are another great danger to kangaroos. When the kangaroos go down to drink, the sandflies sting them round their eyes, making them so blind, at least for a time, that they cannot see to find food or to defend themselves against their enemies. Many kangaroos die in this way.

The native people of Australia, the Aborigines or ‘ blackfellows ’, hunt kangaroos for food. Blackfellows are rather short, dark-brown people, who live in tribes in the hot central part of Australia, called the ‘ bush ’, where white men hardly ever go. It is very dry, and only gum-trees, salt-bushes, and thin grass can grow there.



Blackfellows live in a very simple way, just as the earliest men in the world did. They are always moving about, looking for water and food. They have no more possessions than they can easily carry. Each man has a bundle of long spears for hunting kangaroos and other animals, a boomerang or throwing stick; each woman has a dish, some grinding-stones, a stone knife, and a digging-stick for digging up roots to eat.

Blackfellows have no clothes and no houses. When white people began to give them clothes, they often died, because they went on wearing the clothes even when they were wet through or dirty, and this made them ill. They build rough shelters with branches of

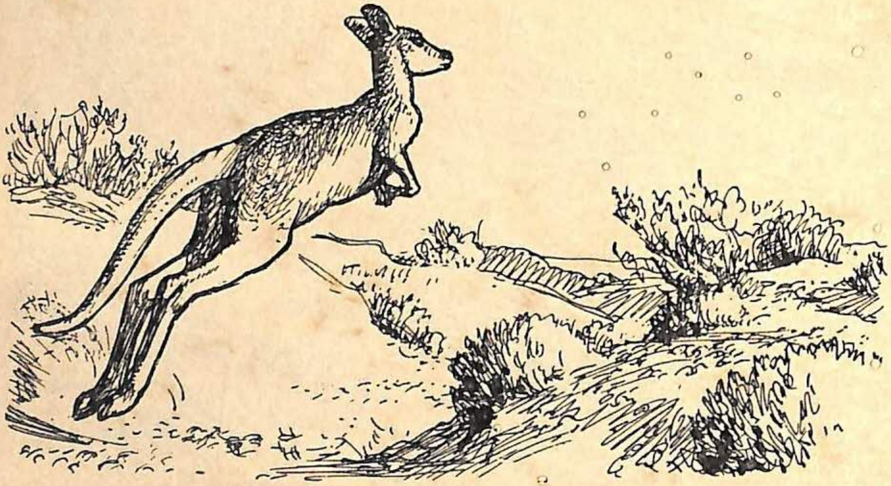


A BLACKFELLOW FAMILY
IN THE DESERT

trees, and perhaps a kangaroo skin to give them extra protection.

The men are very clever at throwing their spears at fast-moving animals. The small boys practise by throwing their toy spears at a round piece of rock which another boy rolls along; and so they learn when they are still very young to hit a leaping kangaroo. Food is so difficult to find that children have to learn when they are young to find food for themselves.

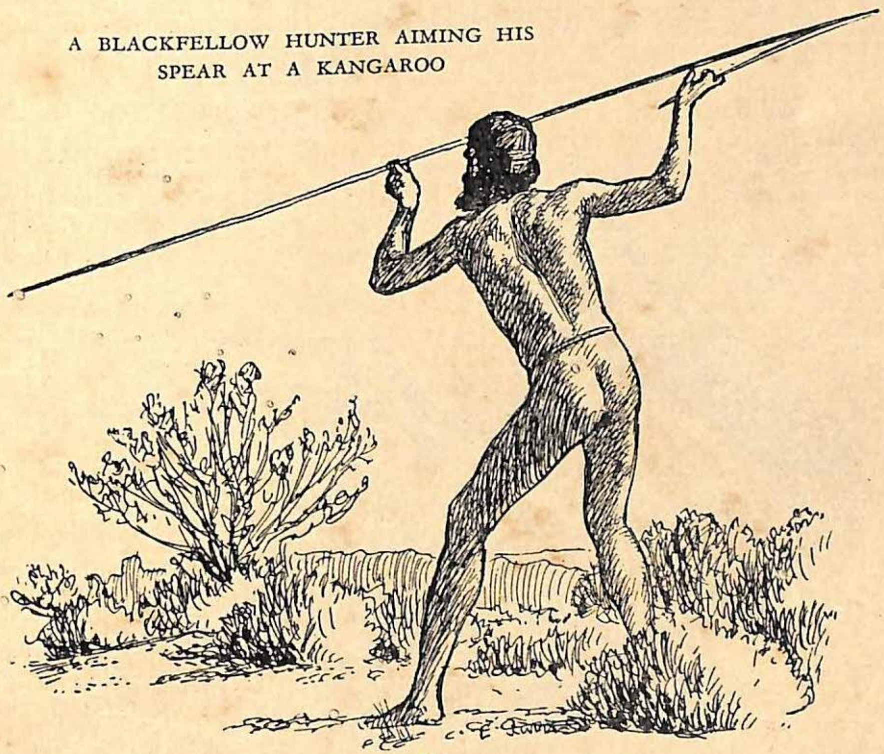
The blackfellows hunt kangaroos in large bands. When they have found a family of kangaroos, some of them with their spears hide beside a well-worn kangaroo track, which they know that the kangaroos are accustomed to use, while others go off to round up the kangaroos and drive

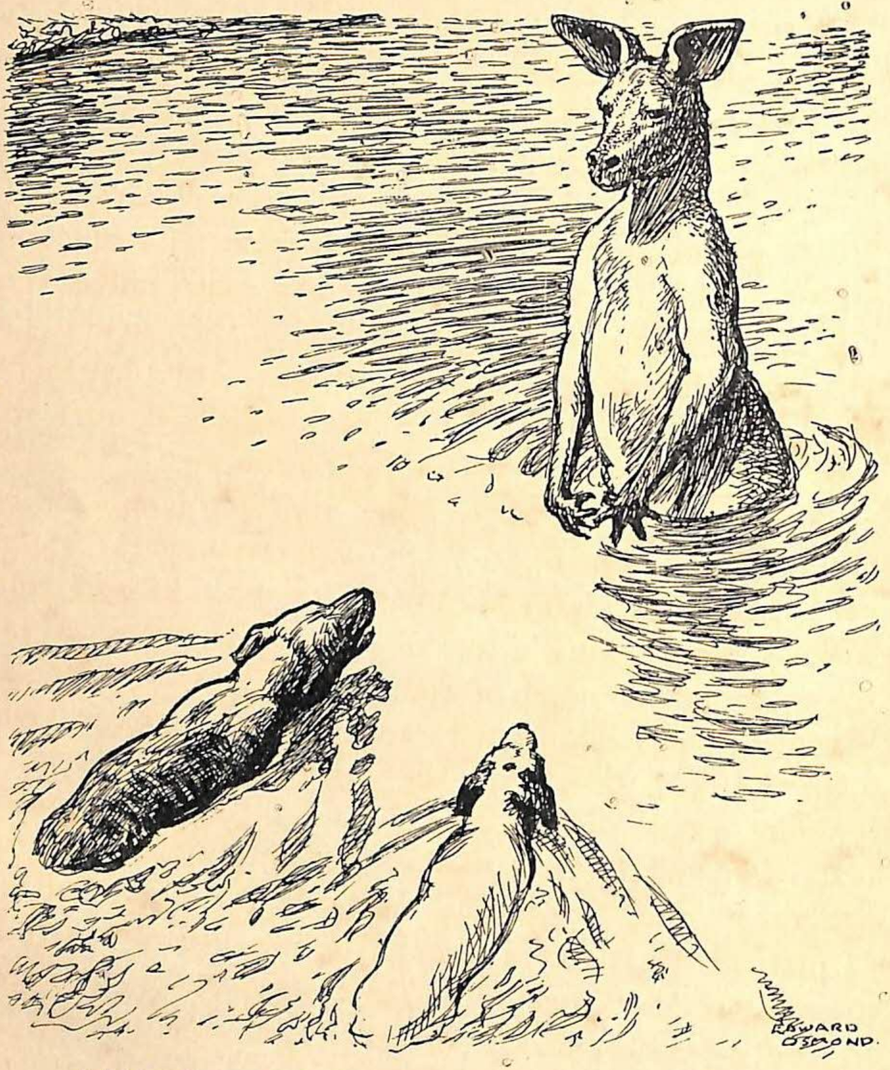


them gently in the right direction. The kangaroos are not really frightened, because they know that they can travel much faster than a man can. So they move steadily in single file along their well-worn track. Like this they fall an easy prey to the hidden spearmen.

Skilled blackfellow hunters hunt a single kangaroo feeding by itself in a different way. The hunter knows that a kangaroo will not notice him if he keeps quite still;

A BLACKFELLOW HUNTER AIMING HIS SPEAR AT A KANGAROO




EDWARD OSMOND.

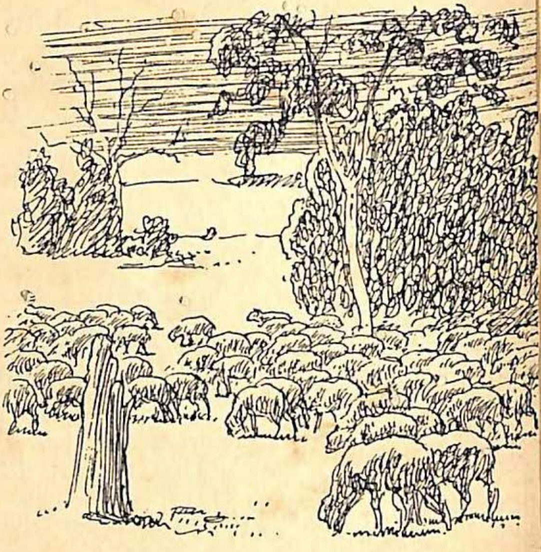
A KANGAROO ATTACKED BY DOGS STANDS AT BAY IN A POOL and it will not smell him if the wind is blowing in the opposite direction. He knows that a feeding kangaroo always lifts its head to look round every few minutes. So he takes care to be perfectly still until the kangaroo, seeing nothing moving, bends down to feed again. Then he moves forward a few paces. In this way he patiently creeps up near enough to throw his spear with sure aim. In this kind of stalking the hunter must move very gently. If he kicks a stone or snaps a twig so that the kangaroo hears him, or if he treads heavily on the ground so that the kangaroo feels the ground shake through the pads of its feet, it will take to flight at once.

The hunters keep large, fierce dogs for hunting kangaroos, but even these great dogs sometimes cannot get the better of a large buck kangaroo when he is fighting with his back against a tree or rock. Sometimes he will wade out into a pond or lake and wait for them there. When the dogs swim out to attack him, he tries to grab them and hold them under the water to drown them.

White people did not live in Australia until about 165 years ago, when Capt. James Cook brought the first settlers to make their homes near where Sydney now is. At first they kept to the pleasant, fertile districts near the coast. But later they found that sheep could be kept on the open grasslands farther inland—the grasslands that had always been the home of the red kangaroo. So

591.9
Osm

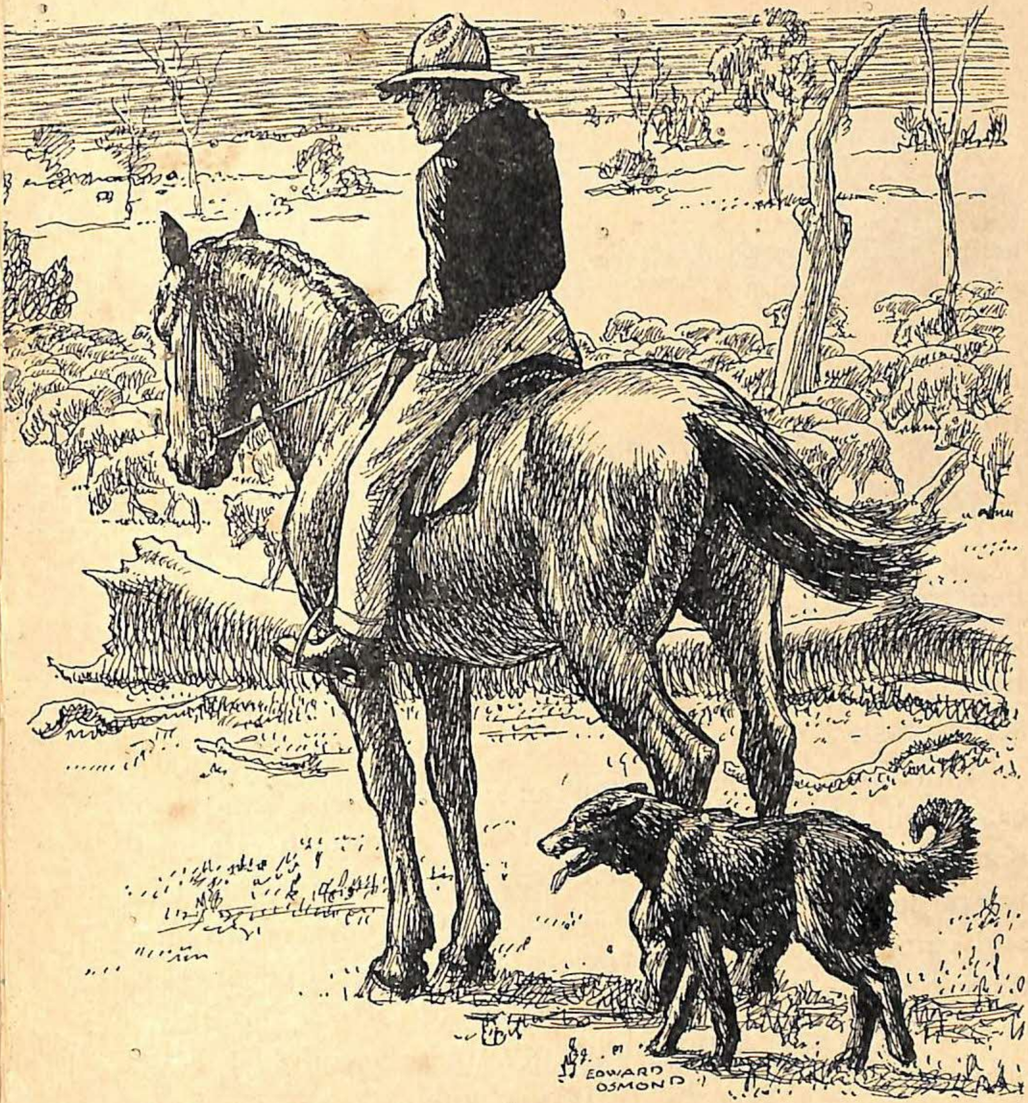
AN AUSTRALIAN SHEPHERD
WITH HIS FLOCK

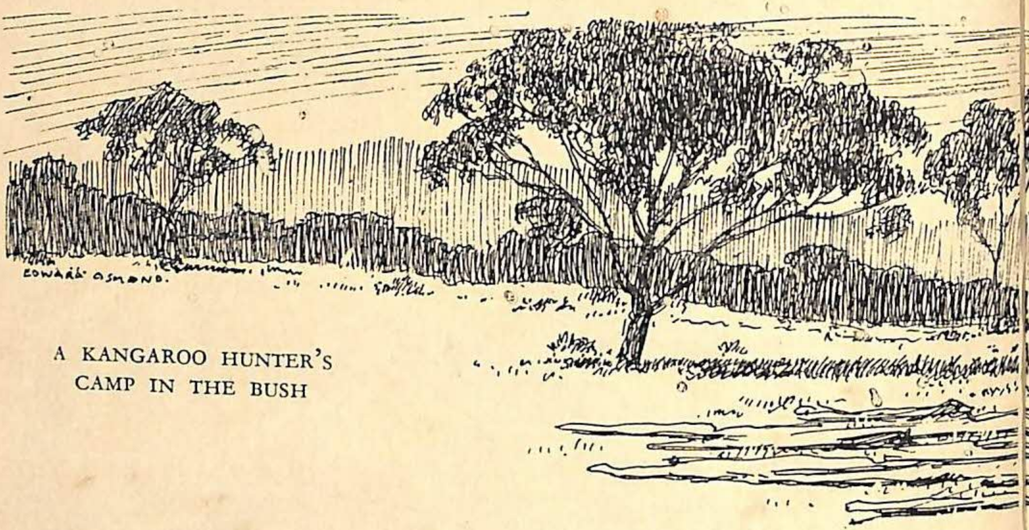


the white men began to build farms and to fence in paddocks for their flocks of sheep.

The kangaroos did not mind much about the fences, because they could usually either jump over them or creep under them. When grass was plentiful the sheep and the kangaroos could live together, both eating the grass; but when dry weather parched the land, and the grass began to get scarce, the farmers found the kangaroos a great nuisance. Kangaroos can nibble grass off much shorter than sheep can; so where a kangaroo has grazed there is nothing left that a sheep can eat. So there began a struggle between the farmers and the kangaroos. In some places the farmers decided to destroy all the kangaroos on their land, and in one district they killed as many as 60,000 kangaroos in six months.

Although the farmers killed many thousands of kangaroos at different times to protect their sheep, there are still a great many kangaroos in Australia. There are


EDWARD
OSMOND

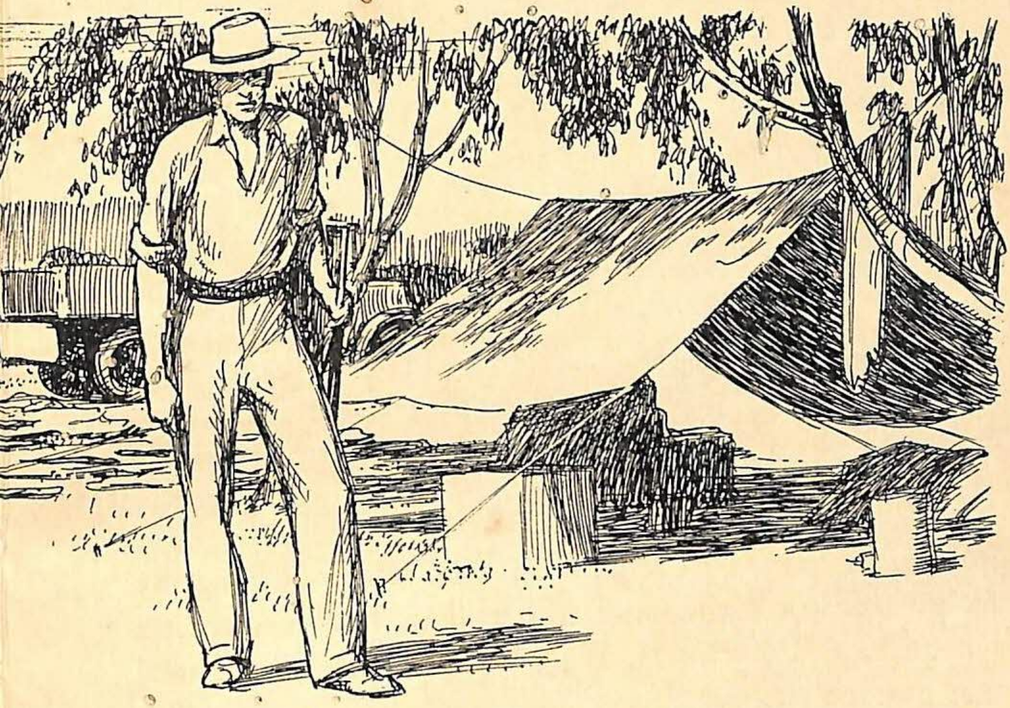


A KANGAROO HUNTER'S
CAMP IN THE BUSH

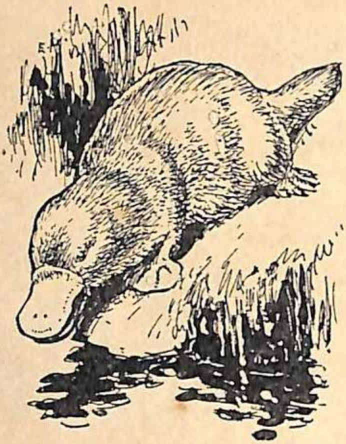
enormous stretches of land where the white men hardly ever go, and there the kangaroos still live, often creeping back on to the sheep pastures whenever they can to steal some grass.

White men hunt kangaroos not only to keep them from eating all the grass, but also for the sake of their skins. Kangaroo skins are soft and fine and also very strong, which makes them most valuable. The hunters go out and camp in the bush where the kangaroos live. They track down a family of kangaroos and shoot them with guns. Then they skin them, throw away their bodies, and take the skins.

Kangaroos, as we know, eat other plants besides grass.



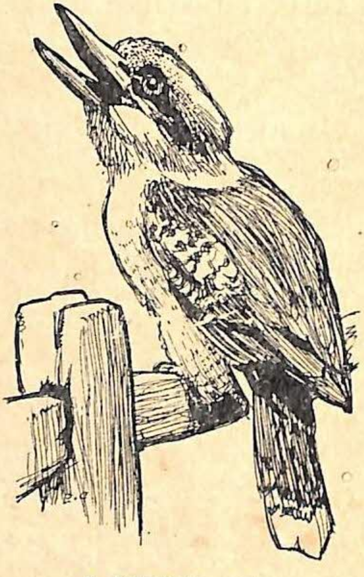
They eat young heather and the new shoots of wattle, gum-trees, and salt-bushes. Most of the common plants in Australia are ones which do not need much water. In the bush, where water is very scarce, the trees are like scrubby bushes with short, thick stems and leathery, spiky leaves which hold the moisture. There are many different kinds of gum-trees, from the eucalyptus tree of the forest, which grows 300 feet tall and has a smooth white or pinky-red trunk, to the dwarf mallee gum of the



A DUCK-BILLED PLATYPUS

bush, only a few feet high. Many Australian trees and bushes have gorgeous flowers—the tulip-trees, for instance, and the flame trees and fire trees which have great crimson and orange blossoms.

Of the many strange animals that live in the forests and grasslands of Australia, perhaps the strangest is the duck-billed platypus. Although it lays eggs and has webbed feet and a beak like a duck, it has four legs and feeds its babies on its own milk. There are also enormous bats, called flying foxes, which live on fruit and eucalyptus flowers, and ant-eaters with long, sharp spines instead of hair; and there are very large lizards, some of them as much as 6 feet long or even longer. The largest Australian bird is the emu, which has very long legs like an ostrich and wings so small that it cannot



A KOOKABURRA

fly. The kookaburra, a giant kingfisher, laughs instead of singing; and there are beautiful birds such as the lyre-bird, which shows off its magnificent tail when it is courting, and the Australian swan, which is black.

The prettiest and most friendly of the marsupials, relatives of the kangaroos, are the koalas or tree-bears. Koalas look like little, grey-brown teddy-bears with big black noses. They seldom drink, but live on the moist leaves of the gum-trees. The baby koala, when it is big enough to leave its mother's pouch, likes to cling to her back. Several of them can sometimes be seen sitting one behind the other along a branch. The flying squirrels, which are not really squirrels, have a great deal of loose

A GUM-TREE

A KOALA BEAR WITH ITS BABY ON ITS BACK

skin between their legs, so that when they jump from a tree, the skin forms a kind of parachute, and they can glide down through the air as though they were flying.

There are other kinds of kangaroo in Australia as well as the red kangaroo. The great grey kangaroo is nearly as large as the red kangaroo. It is often called the 'forester', because its home is among the woodlands of south-east Australia instead of on the open grassland. But now the grey kangaroo is becoming rather rare, because men have built farms and towns in the fertile country where it used to live, and corn and other crops grow where the forester used to roam.

Another kind of kangaroo lives in the large island of Tasmania, to the south-east of Australia; and a very dark-coloured kangaroo lives in an island, called Kangaroo Island, near the south coast of Australia. These kangaroos can swim very well; one of them is said to have swum 2 miles in the sea when it was being hunted.

There are mountain ranges in Australia as well as grasslands, desert, and forest. In these mountains live the 'wallaroos'—a very strong, thick-set kangaroo which can leap about on the rough, rocky hillsides. Wallaroos are sometimes grey or reddish-brown or dark-brown, according to the colour of the rocks where they live. Those that live high up in the mountains, where it is cold, have thick fur coats.

The wallabies are little kangaroos with furry coats. Being small, they cannot bound along as fast as the red kangaroos; so when there is danger, they hide instead of running away. So they never go very far away from the thick bushes in which they can hide, and are seen in the open only in the early morning or late afternoon when they are feeding.

Some of the wallabies live with the wallaroos among the rocks and cliffs of the mountain ranges. These rock wallabies are very lively little animals; they do amazing acrobatics on their hind legs, bounding about the steep, rocky slopes and along the edges of steep cliffs. They have rough pads under their feet, which give them a good grip on the surface of the rocks and make them very sure-footed. They often spend the hot part of the day lying in a cool cave or under an over-hanging shelf of rock.

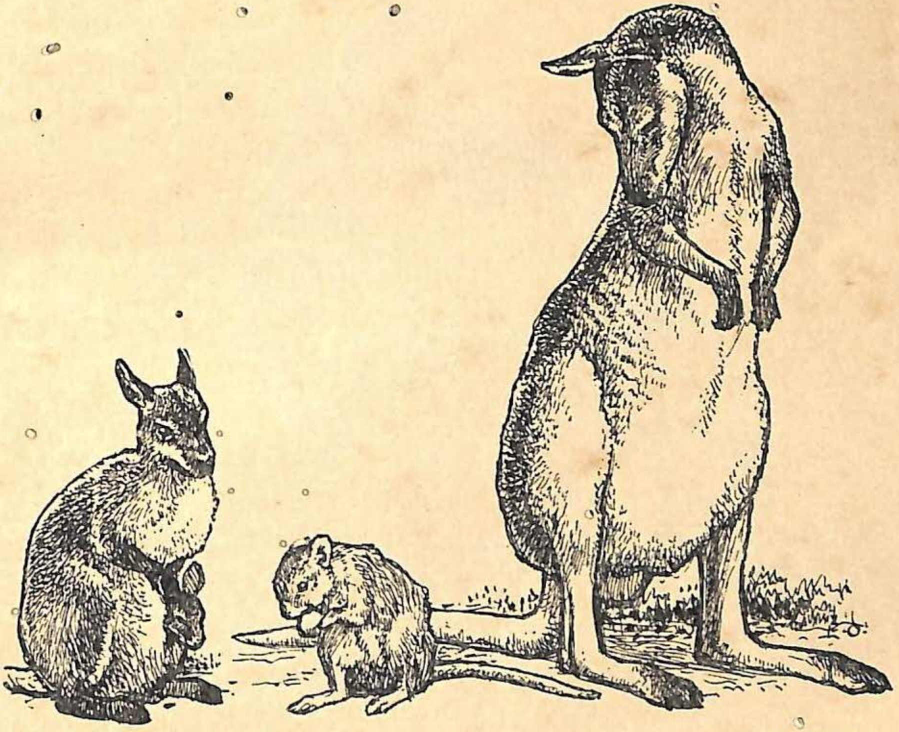
Some kangaroos live in trees. They belong to the

A TREE-KANGAROO IN A HOT FOREST IN NORTH AUSTRALIA

hot forests in North Australia and in the large island of New Guinea. To help them to climb better their front legs are nearly as long as their hind legs, and they have rough pads on their feet. They spend most of their time climbing about in the tall trees, and can often be seen high up in the branches.

There are some members of the kangaroo family as small as rabbits. These are called rat kangaroos, and they live in the thick undergrowth.

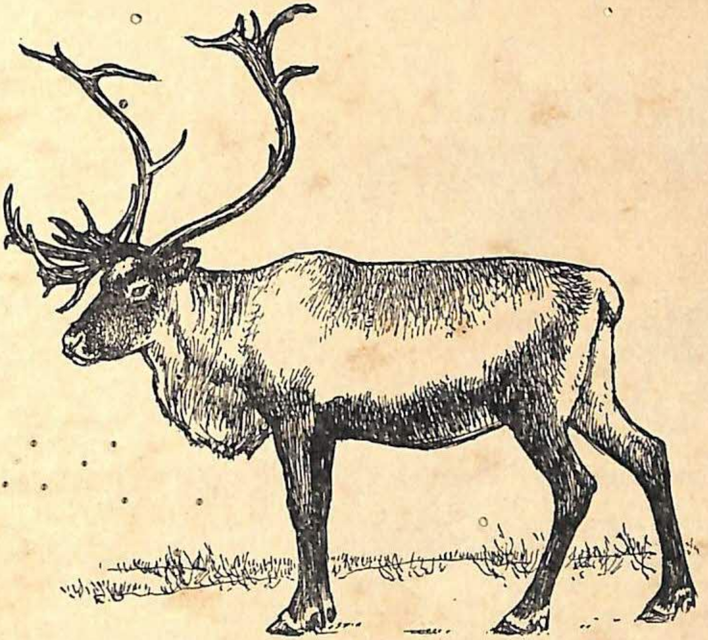
All these various members of the kangaroo family—the big red kangaroos of the open plains, the tree kangaroos of the hot forests, the wallaroos of the rocky mountains, and the wallabies and the little rat kangaroos of the thickets—are different from each other. This is because they live in different kinds of places and therefore have to live in quite different ways. But they have certain things in common: they all move by hopping on their hind legs; they all have long, strong tails; and they all carry their babies in pouches until they are big enough to look after themselves.

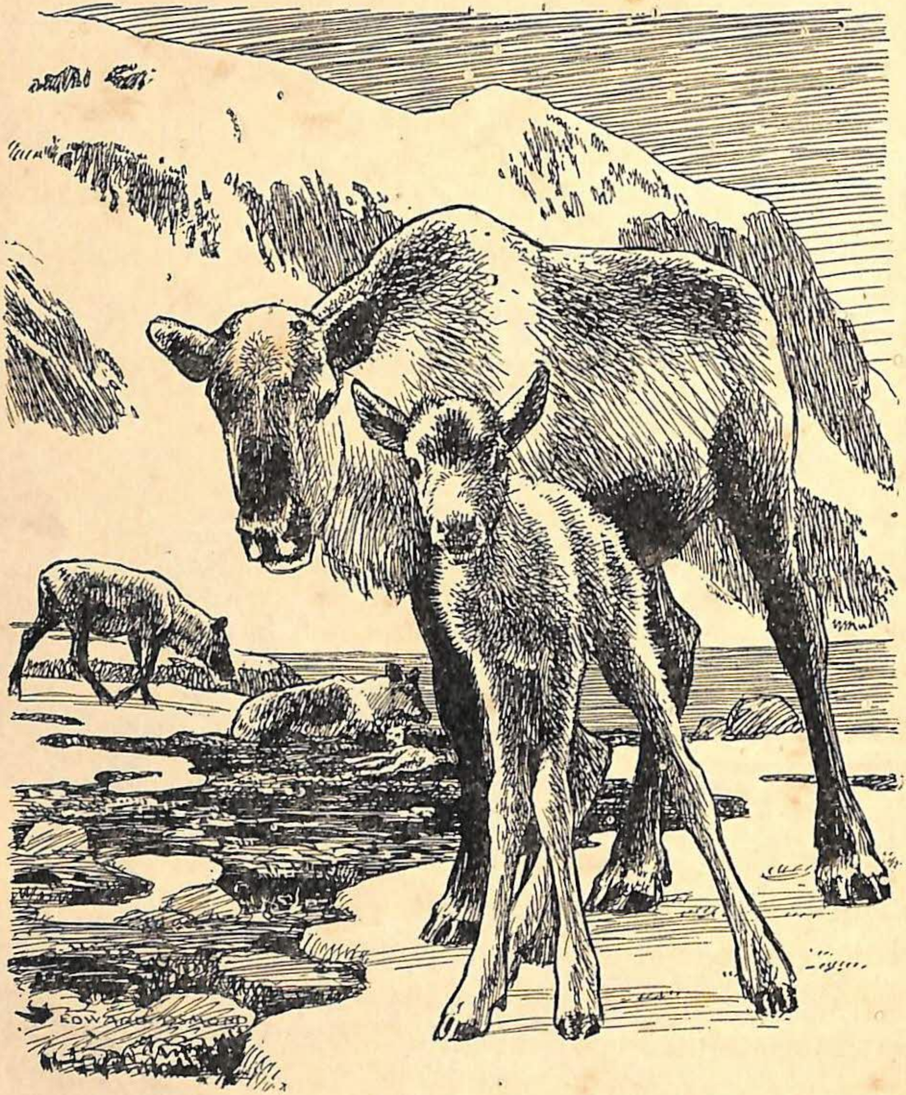


A WALLABY, A RAT KANGAROO, AND A RED KANGAROO COMPARED

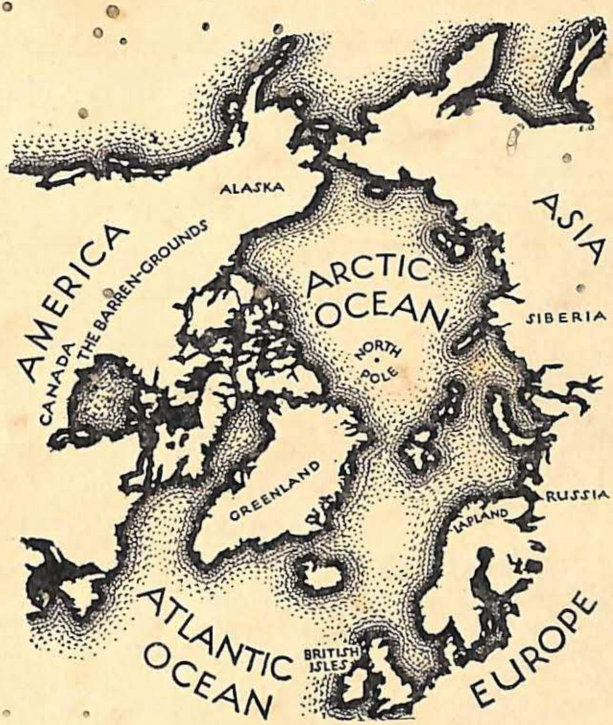
THE HEAD OF A KANGAROO

REINDEER





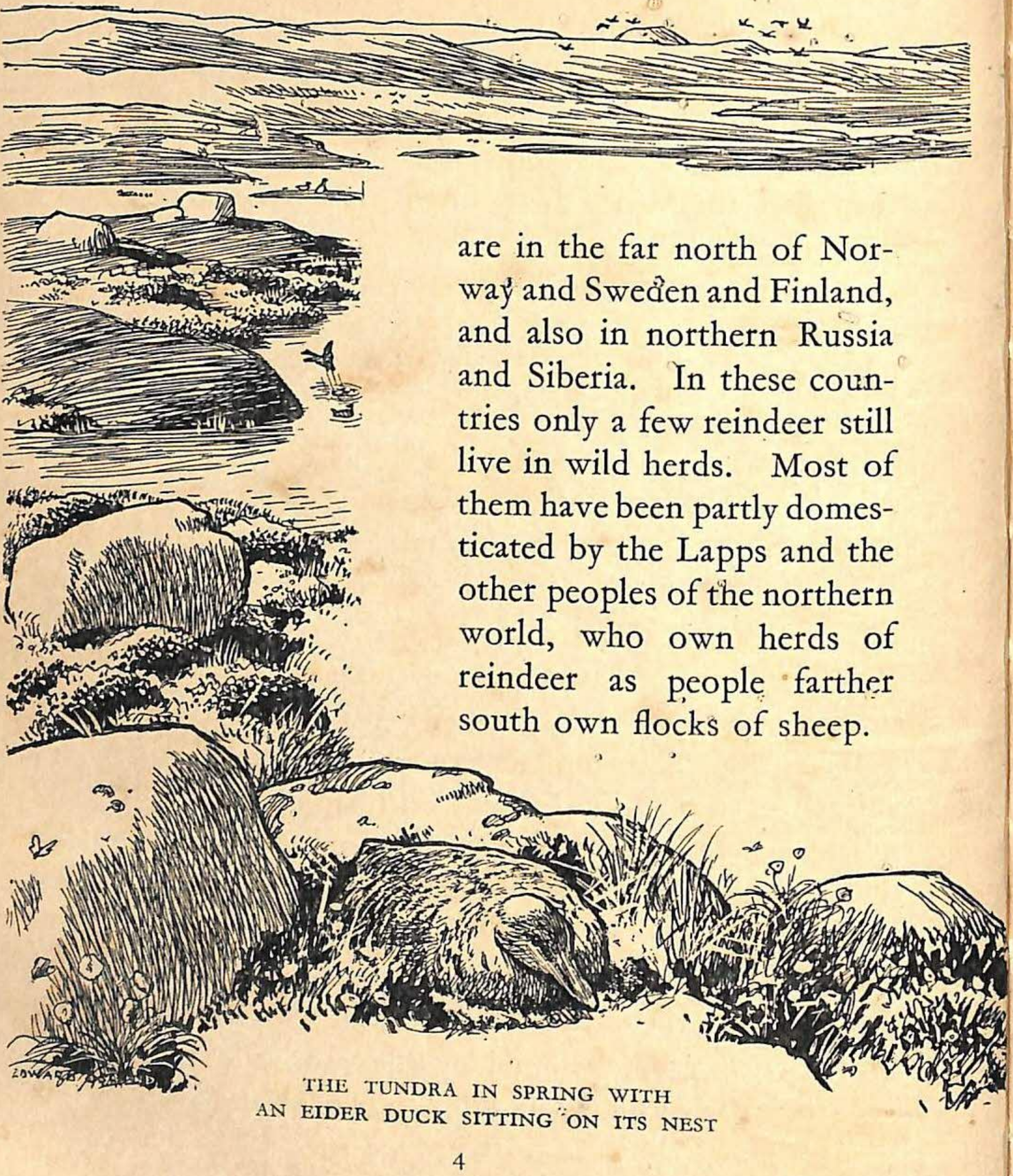
A CARIBOU COW WITH HER NEW-BORN CALF



MAP SHOWING THE TUNDRA REGIONS

REINDEER

REINDEER live chiefly in the very cold northern countries which lie around the Arctic Ocean. Some of these countries belong to the continent of North America. In these lands—northern Canada, Alaska, and Greenland—the reindeer are called caribou. They live in large wild herds and are hunted by the people of those lands for their flesh and their skins. The other Arctic lands are in the far north of Norway and Sweden and Finland, and also in northern Russia and Siberia. In these countries only a few reindeer still live in wild herds. Most of them have been partly domesticated by the Lapps and the other peoples of the northern world, who own herds of reindeer as people farther south own flocks of sheep.



THE TUNDRA IN SPRING WITH
AN EIDER DUCK SITTING ON ITS NEST

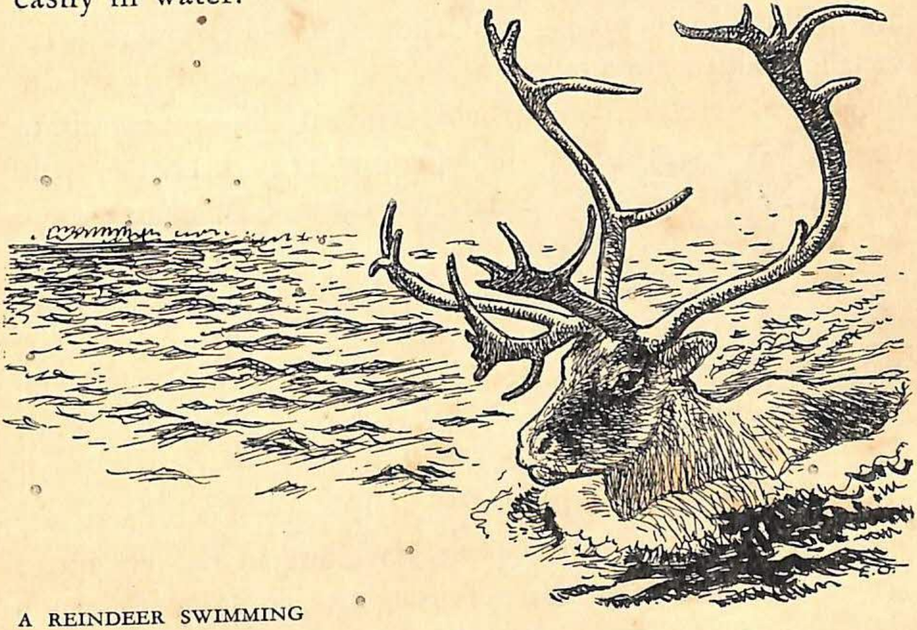
The lands around the Arctic Ocean, called 'tundra', are cold and bleak. Even the sea freezes right across in winter. On land the ground and the rivers and lakes are frozen hard, and snow lies on the ground for more than half the year. In many parts the winter lasts for 9 months of the year. In the summer it is warm for perhaps 2 or 3 months, but only the surface of the ground is thawed through. A few feet below the surface the ground is frozen as hard as iron all the year round.

Big trees cannot force their roots through the frozen ground, so no big trees can grow. Little, stunted, dwarf trees and shrubs are found in many places, but they seldom grow much higher than a man's knee. Otherwise only small plants and mosses and lichens, which can withstand the severe frosts, grow in the tundra. Bushes of red cranberries and orange cloudberries grow in many places.

When the short summer comes, and the sun thaws the surface of the ground, many brilliant flowers spring up quickly—Arctic poppies, crimson saxifrages, yellow aconites, and others. In some places there is grass, and everywhere there are green mosses and lichens. Summer bees, butterflies, and other insects fly among the bright flowers, and the weather may even be very hot for a short period. The sun rises higher in the sky each day, and the days get rapidly longer, until for a few weeks round about mid-summer the sun hardly sets at all at night. Soon, however, winter descends again, and the days get shorter and shorter until there is practically no daylight at all. In winter-time hardly anything is to be seen except mile after mile of snow, or bare, black rocks from which the fierce winds have blown the snow away. The winds blow the snow into hollows, where it forms snow-drifts many feet deep.

We might wonder how people or animals can live in lands with so long and severe a winter. In fact, many people and animals do make their homes in these lands; but they live a very different life from those in warmer countries. Both people and animals move about a great deal instead of making their homes in one place, as we do. They generally move farther south in the coldest times of the year, and go to the very northern places only in the summer months. Such movements of people and animals are called 'migrations'.

Reindeer can live in these cold lands because they have very warm coats indeed. A reindeer's fur is one of the warmest kinds of fur that is known. It is not very long, except round the reindeer's throat; in fact, it is not nearly so long as the fur of some of the other animals living in the same parts of the world—the musk ox or the polar bear, for example. But travellers in the far north would usually rather have reindeer skins as blankets on their beds than any other kind of fur. Reindeer coats are made of very thick, coarse hair, and they have soft, warm fur over their ears and noses. A fur coat is warm partly because there are little gaps between the hairs of the fur which hold a lot of air. This air becomes warm, and it keeps out the colder air from outside. A reindeer's hairs not only hold the warm air between them, but each hair is also like a tiny tube filled with air. This extra closed-in air makes the reindeer coat particularly warm. The air in the reindeer's fur also makes the fur very buoyant, like water-wings, so that the reindeer can float easily in water.



A REINDEER SWIMMING

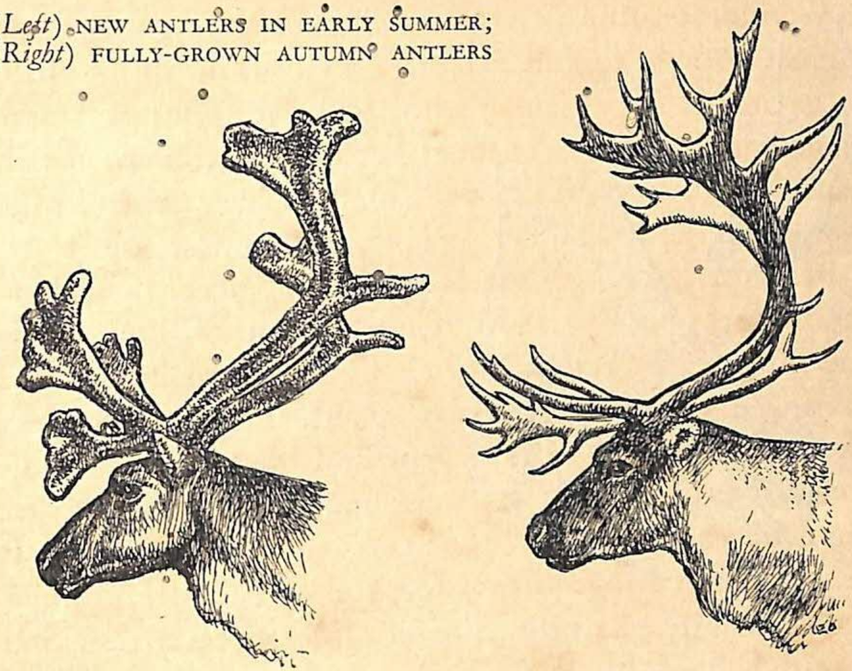
A reindeer could not carry a long, heavy coat, because it must be able to run very fast in order to escape from its enemies, in particular from wolves. Reindeer rarely stand and defy their enemies, as musk oxen do, for instance, but rely on their speed in the open country to get away from them.

Reindeer are not as graceful as the little fallow deer we see in parks in England. They have large, long bodies and thick necks, and they generally hold their heads rather low. They have large, wide hoofs, and their legs look rather slender for carrying such thick bodies and large feet. The reindeer of Europe and Asia are about $3\frac{1}{2}$ feet high, like small ponies; but the caribou of America are usually about a foot taller.

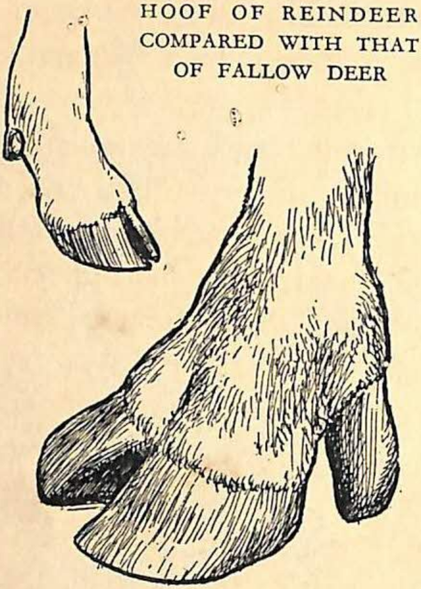
The reindeer's antlers are magnificent. Those of the American stags often stretch as much as 4 feet from tip to tip. With most deer, only the stags carry antlers, but the reindeer does (females) also have them, and use them to protect their fawns from danger. Reindeer shed their antlers every winter, but the does keep theirs

REINDEER BULL WITHOUT ANTLERS IN LATE WINTER OR EARLY SPRING

(*Left*) NEW ANTLERS IN EARLY SUMMER;
(*Right*) FULLY-GROWN AUTUMN ANTLERS



longer than the stags do, often for some months longer. The antlers grow again after the winter. At first the new antlers are covered with furry skin and look big and clumsy; but when they are fully grown, the skin sheds off. Reindeer also change their colour a good deal with the change of seasons. In summer their coats are usually a rich, dark brown, which shades to almost white on their necks and underparts. But as their winter coat grows during the autumn they become lighter and greyer, so that they are less conspicuous in the winter landscape.



HOOF OF REINDEER COMPARED WITH THAT OF FALLOW DEER

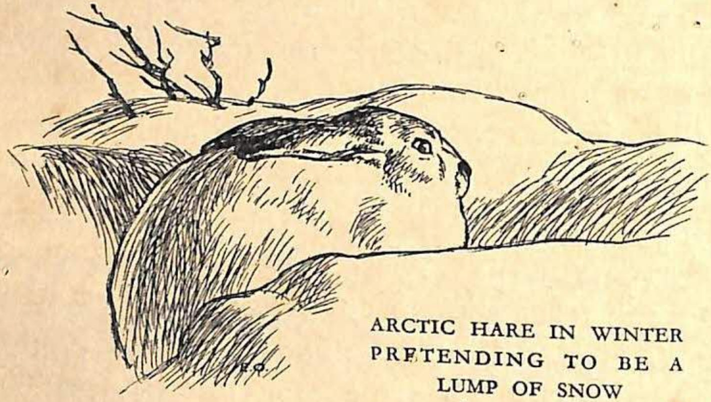
All deer have hoofs which are divided into two main toes, like those of cows and sheep, with two smaller ones behind which usually do not touch the ground. The hoofs of reindeer spread out widely when they are placed on the ground. This prevents their sinking into the soft snow or swampy summer ground, and helps them not to slip on hard frozen snow or ice. Their feet, though not as dainty as those of fallow deer or red deer, are exactly right for the country in which they live.

Reindeer use the sharp edges of their hoofs for digging through the crust of frozen snow to reach their food. In the summer there are plenty of plants to provide them with food, and they grow fat, but in the winter, when these plants have died down, the reindeer live on mosses and lichens, which provide good food all through the year. The kind of lichen which the reindeer chiefly live on is called ‘reindeer moss’. They always seem to know where this reindeer moss is to be found, even though they may have to dig even as deep as 4 or 5 feet through the snow to find it. In spite of reindeer moss, however, by the end of the winter the reindeer have generally become very thin.

There is a story of a famous traveller who was journeying across the tundra on a reindeer sledge. Once, after a long day's journey across the snow, he stopped for the night at a lonely house and unharnessed his reindeer and turned it loose as usual to find its own supper. But the reindeer was very tired, and the traveller was sorry for it and wished to help it to dig for reindeer moss. So he got a shovel and began to dig through the snow. He worked as hard as he could, but when he got through the snow there was no moss. In the meantime the reindeer, who was digging somewhere else, got through the snow with his hoofs much faster than the man with his shovel, and had soon uncovered plenty of moss. When the reindeer had eaten a good supper, he lay down in the snow and slept snug and warm inside his cold-proof coat.

Reindeer always live in herds, and their safety often depends on keeping together on the darkest nights or in blinding blizzards. If an animal gets separated from its herd it will almost certainly be overtaken by wolves or some other enemy and be killed. Reindeer make a clicking sound when they walk; this noise comes from inside their ankles, and it is probably useful in helping them to keep together at night. The fawns can follow their mothers even when they cannot see them.

There are not many other kinds of animals in these cold Arctic lands. Polar bears and seals live partly in the sea and stay the whole year round in the far north. The Arctic fox grows a beautiful white coat in the winter to suit its snowy surroundings, and so do the Arctic hares, which in America some people call Snowshoe rabbits. They have thick fur on the soles of their feet to help them run over the snow. The musk oxen live in some parts of northern Canada and Greenland. They are smaller than our cattle, but in the winter they look bigger than they really are because of their long, dark brown, shaggy coats. In the spring and summer many small birds nest and hatch their eggs in the tundra, but fly south for the winter. The great snowy owls, who



ARCTIC HARE IN WINTER
PRETENDING TO BE A
LUMP OF SNOW

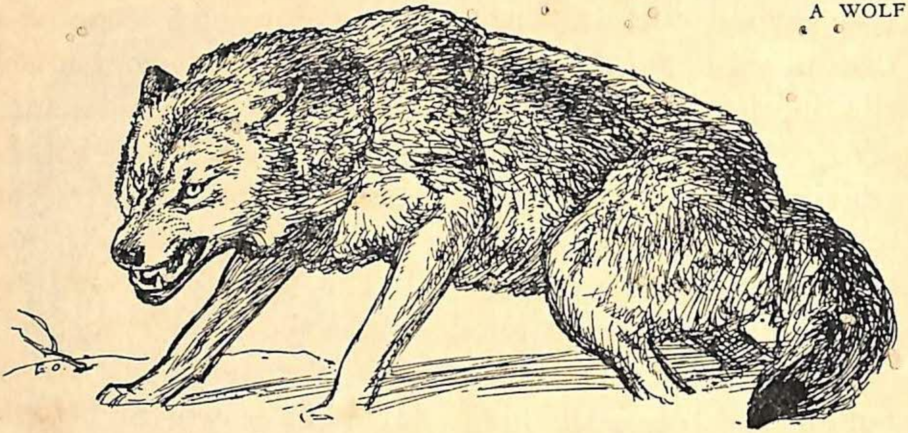
catch small birds for their food, also follow them south.

A SNOWY OWL

The most dangerous animals in Arctic lands are the wolves, which are found all over the tundra. They usually hunt singly or in pairs; but when they get very hungry they sometimes hunt in family packs, and then they are extremely fierce and bold. They can run for miles at a long, tireless gallop, and catch their prey by tiring them out.

The caribou of America are the largest of the reindeer. The native people of North America, the Red Indians and Eskimoes, have never tried to domesticate reindeer, as the Lapps and people of Siberia have. So the caribou live in wild herds and move from place to place in search of good food. Some caribou spend the summer in the open, treeless, tundra lands, which the Americans call the 'barren-grounds'. But when the winter begins to come, they start on long journeys, usually taking the same course every year, to reach the great pine forests which lie to the south of the barren-grounds. They spend the cold winter months in the shelter of the pine forests, and then in

A WOLF



spring-time they make another great migration back to the open country.

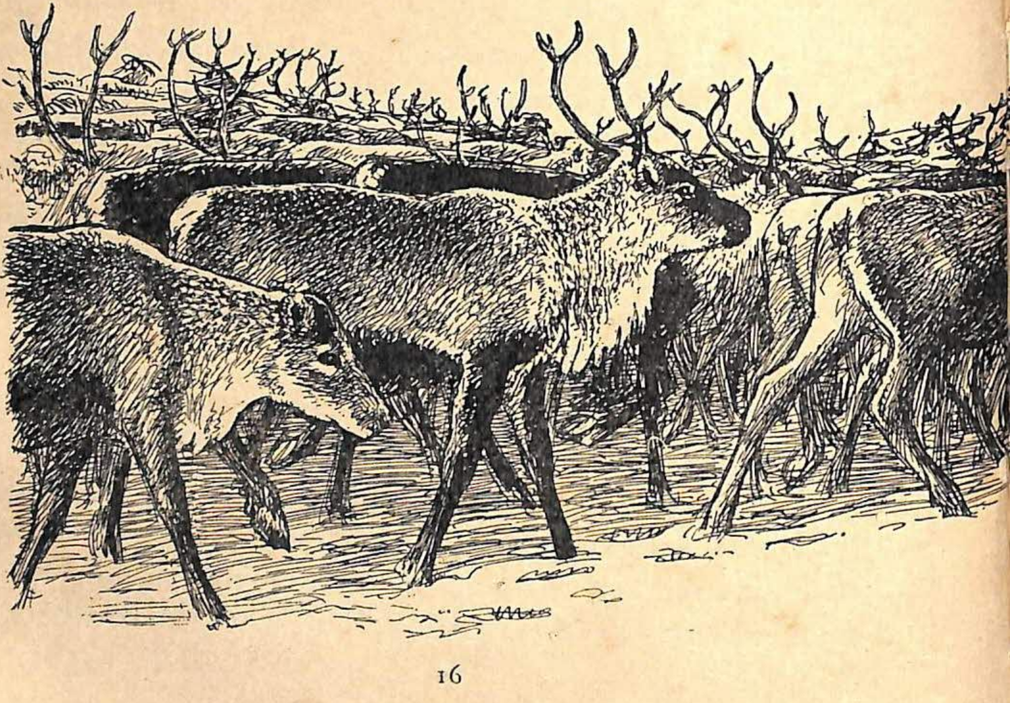
When the first signs of spring appear the caribou, which are scattered about in small herds through the pine forests, begin to become restless. Their instinct tells them that they must soon be on the move. So the small herds begin to move northwards, and as they go they join other small herds, until at last there is a great army of reindeer all moving steadily northwards.

This mighty army has often been known to spread a mile wide in an unbroken mass of animals all moving northwards in the same direction. There are so many of them that it may take several days before they have all passed any particular place--for example, before they have all crossed a river. They keep so close together that anyone watching them coming down the slope of a distant hill might think that the whole hillside was slowly slipping into the valley below. When they are swimming across a river or lake, all the water is full of the bodies of reindeer pushing their way steadily across. They seem to know just where they are going and never seem to hesitate in finding their way. The female caribou, the cows or does, always go first, and the males, the bulls or stags, follow a few days later in a separate great army. Behind and round the herds run packs of wolves, always ready to kill any deer that may not be strong enough to keep up with its fellows.

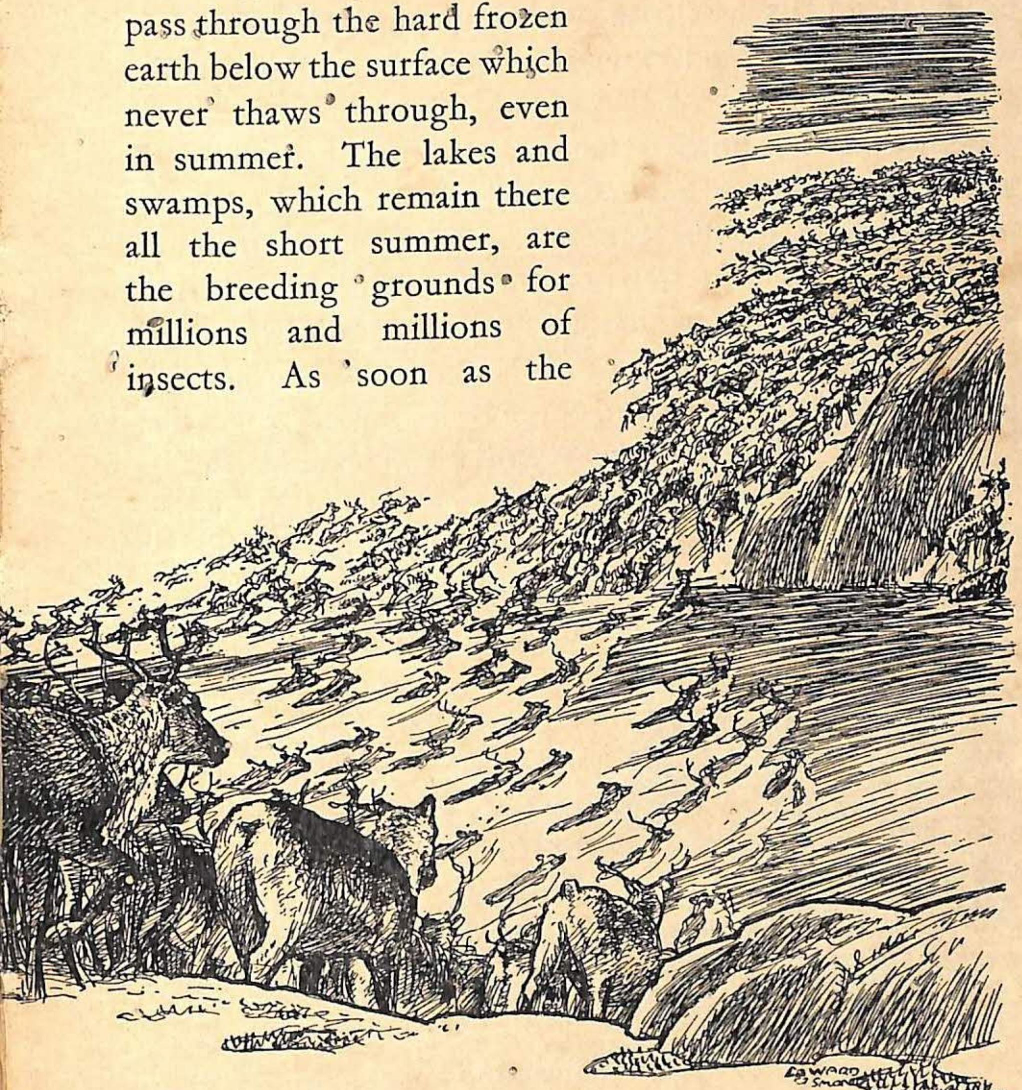
Caribou are usually very timid animals, but when they are herded together like this they do not seem to be afraid of anything. Nothing can stop them or turn them aside. A railway train can whistle as loud and long as it likes, but if the migrating caribou choose to cross the railway line, the train has to stop and wait for them to pass. If a man happens to be overtaken by the great herd he must shout and wave his arms about, or he will be trampled underfoot.

When the reindeer reach the tundra lands, the weather is already warm and there is plenty of good food. But instead of staying there, the herds move quickly across the tundra until they reach the mountains and the sea coast and islands of the farthest north. This is where they spend the first part of the summer and where they breed, and they only move south again after mid-summer. We may wonder why they should not stop and enjoy the good food in the barren-grounds; but there is a very good reason, as we shall see.

After the winter, as soon as it begins to thaw, the summer comes very quickly indeed. The plants all burst into bloom at once, and insects appear everywhere. As the sun melts the snow into water, it flows down the hills and collects in lakes and swamps in the valleys and flat lands. The water cannot sink away because it cannot



pass through the hard frozen earth below the surface which never thaws through, even in summer. The lakes and swamps, which remain there all the short summer, are the breeding grounds for millions and millions of insects. As soon as the

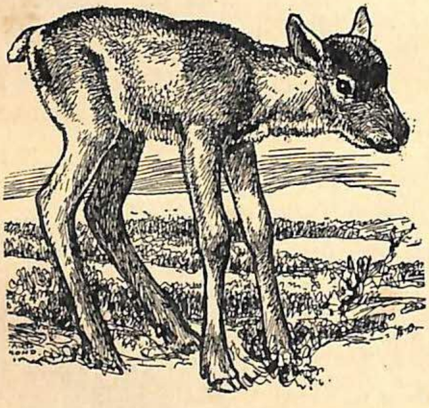


SPRING MIGRATION OF CARIBOU

insects begin to hatch, in June and July, the air hums with mosquitoes, and they make life quite unbearable for men and dogs.

As well as mosquitoes, there are millions of bot flies and warble flies, and it is these that the caribou fear. If they stayed in the flat tundra lands instead of hurrying on north to the colder coasts and islands, the flies would attack them. The warble flies would sting them and lay their eggs under their skin. When the eggs hatched into grubs, they would cause unbearable irritation. The bot flies would attack the nostrils and throats of the caribou. A reindeer which is being attacked by these insects will go quite mad with terror, and has been known to leap to its death over a cliff in its attempt to escape from its tormentors.

The caribou know by the wonderful instinct that animals have on these matters that they must hurry across the tundra before the flies have hatched. In the high mountains or by the Arctic coast and in the islands of the far north there are many fewer flies, and the caribou stay there till the season of insects is over.


A NEW-BORN CALF

The young caribou fawns are born in May. At first they have long, spindly legs and are ungainly little creatures. But they are very charming, with their velvety coats and large, soft, brown eyes. From the very beginning they are wonderfully active, and when they are only a day old they can keep up with the herd. Within a week they can easily escape from a man on foot, and even a wolf has a hard task to overtake them. They grow quickly, and are full-grown by the time they are a year old.

Caribou are not very good mothers, and often lose their fawns. Travellers have sometimes found stray fawns wandering about helplessly, and the fawns sometimes follow the travellers for miles across the tundra, hoping, perhaps, that the men will take the place of their lost mothers.

Even in the cold and windy north the reindeer suffer a good deal from the torment of flies, and during the early summer, after their fawns are born, they become very thin and gaunt. However, by about the middle of August the insect plague is over, and the caribou can move farther south on to the plains again, where there is plenty of food. This is the best time of year for the caribou, and they grow fat and sleek. By the early autumn they are looking their best. Their coats shine with good health, and their antlers, which have been growing through the summer, have reached their full size. The caribou stags, with their fine branching antlers, are much bolder at this time of year.

During October the stags fight fiercely among themselves to win the does, and the strongest stag wins the greatest number of wives. They go on fighting each other all day and night, not even stopping to eat. They charge each other, crashing their antlers together, and the noise of their fighting can often be heard all through the night. They do not as a rule hurt each other very seriously, though occasionally the antlers of two stags become so closely locked together that they cannot get apart again. When this happens the stags may die of starvation before they can separate.

When the first snow of winter falls, the caribou, which are spread out all over the barren-ground in small herds, know that they must start their great migration southwards, back to the shelter of the pine forests. The snow falls first in the farthest north, and the herds there start to move southwards, joining up with other herds as they go, just as they did in the spring when they came northwards. Soon the whole great army is on the move, with wolves following near in the hopes of catching any stragglers. Nearly all the birds and most of the other animals also leave the tundra lands, and by the time winter has set in hardly any living thing moves across those great barren plains.

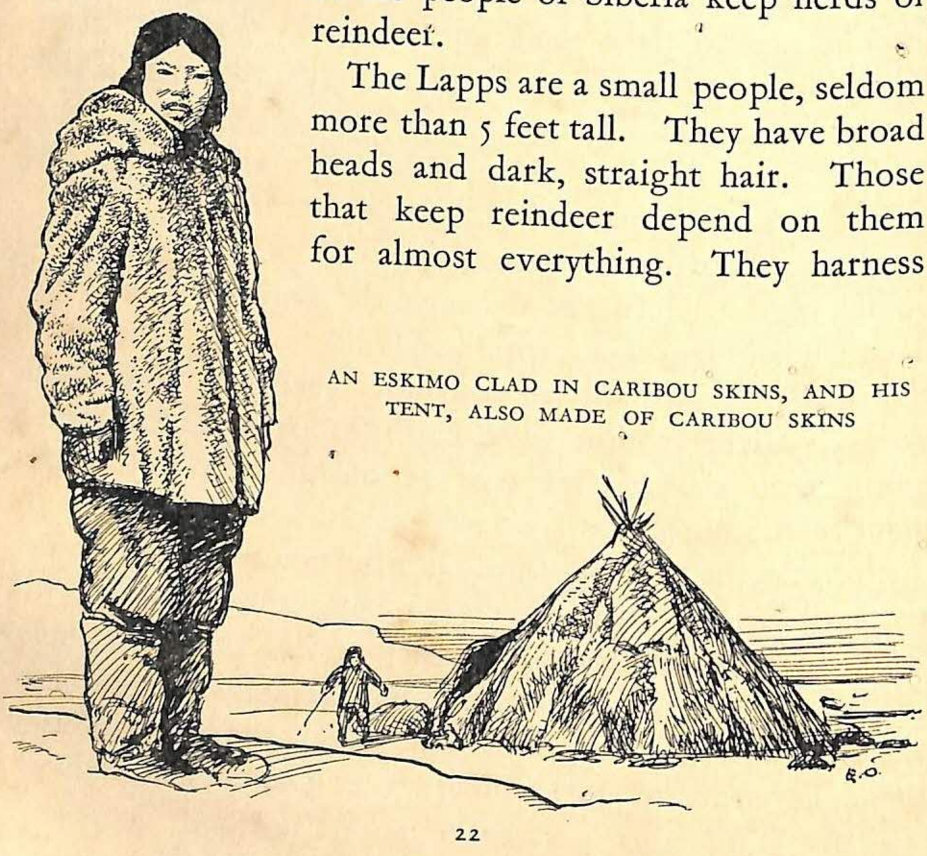
The Red Indians, who live on the edge of the pine forests of North America, hunt the caribou for their flesh and their skins. In the old days, before the Red Indians had guns, they used to make traps to catch the caribou. They dug pits and covered them over so that the animals, not knowing they were there, fell into them. They drove the caribou into narrow gorges from which they could not escape, and then killed them with their spears. They drove them into the water and then speared them from their canoes. They dried the reindeer meat and stored it for the winter, and they made their shirts, leggings, and moccasins or shoes out of the reindeer skins. They often killed many more animals than they really needed, and when they first learnt to use guns, they killed even more, until there were only a few caribou herds left. Now the Government has made laws to protect them. While the caribou are still out on the barren-grounds, the Eskimoes also hunt

A RED INDIAN OF NORTHERN CANADA

them in order to get their winter supply of meat and skins.

The people of the Arctic lands in Europe and Asia depend on reindeer even more than the Indians and Eskimoes do. As we know, most of the reindeer in Europe and Asia are no longer wild, though there are some wild herds in the mountains. The Lapps and many of the people of Siberia keep herds of reindeer.

The Lapps are a small people, seldom more than 5 feet tall. They have broad heads and dark, straight hair. Those that keep reindeer depend on them for almost everything. They harness



AN ESKIMO CLAD IN CARIBOU SKINS, AND HIS TENT, ALSO MADE OF CARIBOU SKINS the reindeer to light sledges and make them drag them long distances. They eat reindeer meat and freeze and cure it and sell it in exchange for other things they need. They milk the reindeer and make cheese from the milk. Each reindeer gives only about half a cup of milk at a time, but as most families have several hundred animals, there is plenty of milk. They make most of their winter clothes, both for men and women, of reindeer skins, and sometimes also their tents in which they generally live. Every Lapp boy has a knife with a handle and sheath made of reindeer horn.

The reindeer of Lapland have to move about in search of food and to make long migrations in spring and autumn, just as the caribou of America do. They have to go up to the Arctic sea-shore or the high mountains in the early summer to escape the plagues of flies, and they return again as winter sets in to reach their distant feeding grounds farther south. The Lapps follow their reindeer, going with them when they go north, and following them to the pine forests when they migrate south. They realize that the reindeer know best when they must move and how far they must travel.

The Lapps, therefore, live most of their lives in tents and are always on the move. Their tents look rather like the wigwams of Red Indians. They have to be very strong in order to withstand fierce blizzards and snow-

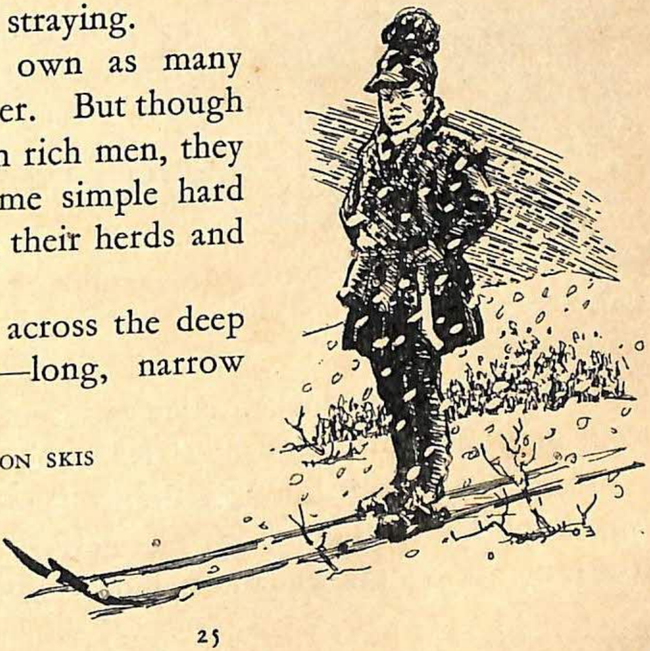
A LAPP TENT

storms in the open tundra. The Lapps spend their time keeping their herd together, preventing them from straying into other herds, and protecting them from the attacks of wolves and other enemies. When the reindeer migrate to their summer homes, they sometimes swim long distances across the sea to islands in the Arctic. The Lapps who own them borrow boats and follow them across the water. In the autumn the whole herd and their Lapp owners make their way back over the sea again to the mainland and start the long journey southwards.

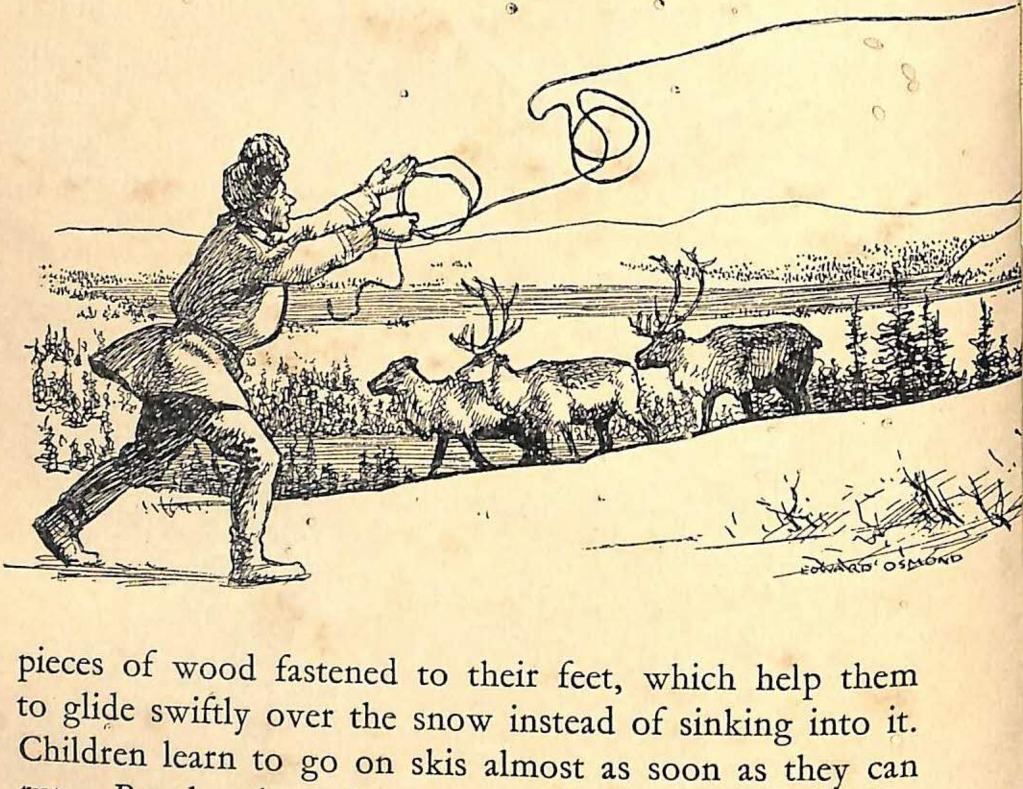
A Lapp counts his wealth in reindeer, not in money. If a Lapp has as few as twenty-five reindeer only, he is a poor man. Twenty-five is too few to make a herd, so the Lapp keeps his deer in a larger herd belonging to a rich man, and he pays for this by helping the rich man to look after the whole herd. In order that he can know which of the deer are his, he marks them on the ear. He does this by cutting a special shaped notch in the ears of the fawns soon after they are born. Each reindeer owner has his own pattern of notches, so that at any time the owners can meet and sort out the deer. Usually the Lapps tie a bell round the neck of one member of the herd. The other deer, who hate to be alone, all try to keep close to the sound of the bell, and so the herd is prevented from straying.

Some Lapps own as many as 10,000 reindeer. But though this makes them rich men, they still live the same simple hard lives, following their herds and living in tents.

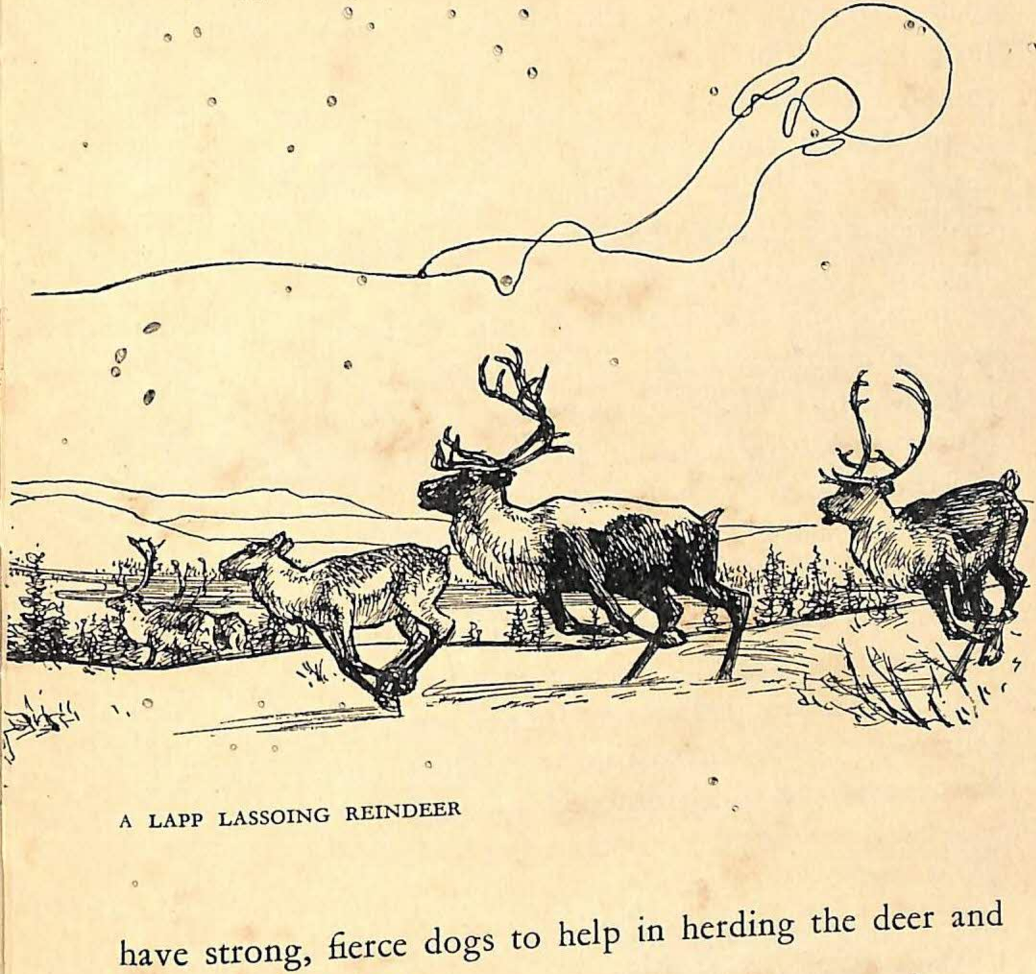
Lapps travel across the deep snow on skis—long, narrow



A LAPP BOY ON SKIS



pieces of wood fastened to their feet, which help them to glide swiftly over the snow instead of sinking into it. Children learn to go on skis almost as soon as they can run. By the time they are 11, boys are taking their share in looking after the reindeer. The Lapps also

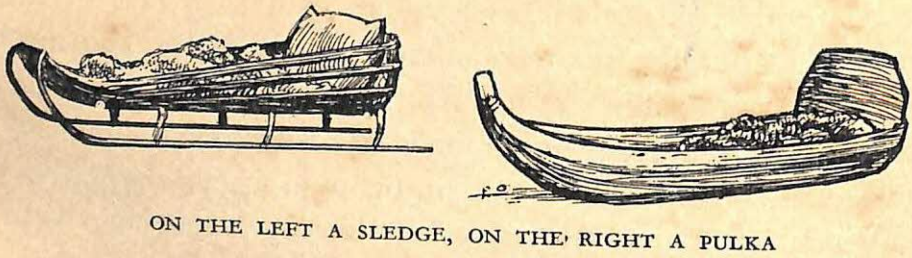


A LAPP LASSOING REINDEER

have strong, fierce dogs to help in herding the deer and to guard the camps.

The Lapps train some of their reindeer to pull sledges. When they are going to start on a journey, the Lapps catch these sledge reindeer with lassos and bring them to the camp to harness them with gay harness hung with little bells. Each sledge is drawn by one reindeer, and the sledges move in strings of about six. One reindeer is the leader, and the others are each tied by a leather thong to the sledge in front. A spare reindeer is generally tied behind the last sledge to act as a brake to the whole string. The sledges are generally left in charge of the women, while the men look after the main herd; the women must travel fast, so that they can set up camp and have hot food ready for the men at the end of the day's journey. Often, however, the journeys are made by night, for then the snow is frozen harder, and the sledges can run more easily.

As well as ordinary sledges with runners like a toboggan, the Lapps use 'pulkas', which have no runners and are shaped like a boat. They are very light, and the reindeer can pull them much faster than a sledge; but they are much more difficult to ride in, as they upset very easily. Reindeer are easily frightened and make sudden swerves,



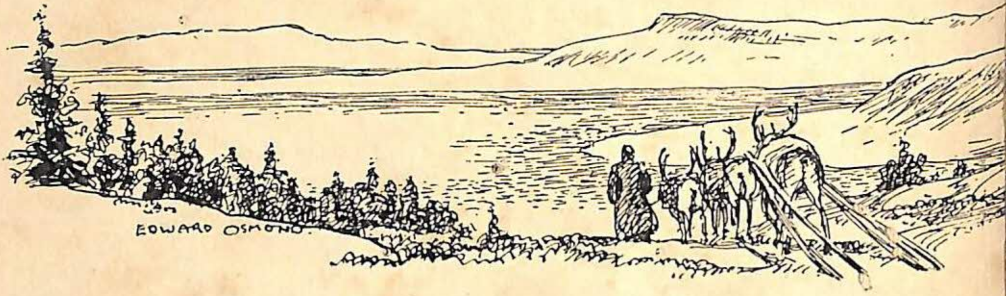
ON THE LEFT A SLEDGE, ON THE RIGHT A PULKA

A FAST JOURNEY IN A PULKA

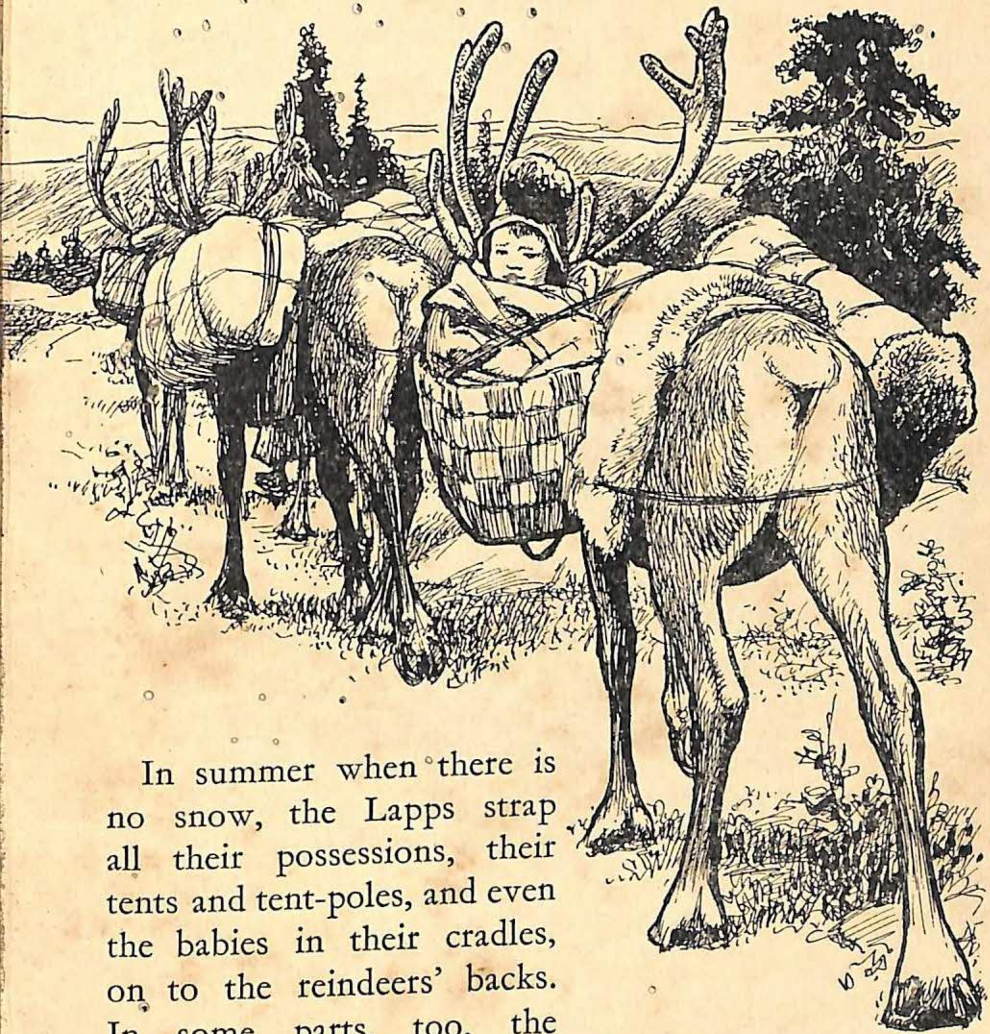
and then the driver is often upset into the snow. A pulka driver must tie his rein firmly on to his wrist so that if he is upset he can still stop the animal. Otherwise the reindeer and pulka might disappear into the distance, leaving the driver helpless in deep snow far from home and almost certain to die of cold and hunger.

A good reindeer will pull a light pulka as fast as 24 miles an hour for short distances, and on a long journey may cover 100 miles in a day. There have been stories of famous reindeer which have travelled 800 miles in two days, but these tales are probably exaggerated.

When the Lapps go out with the reindeer they leave



the camp in charge of the women and girls, who prepare a huge, hot meal of coffee and reindeer meat ready for the men when they come in tired and hungry. Once a Lapp left his camp to go and look after his deer in a blizzard. When at last the wind had died down and he could leave the deer, he made his way back to his camp. But he could find no camp—nothing but smooth, white snow in all directions. He stood wondering what could have happened to his tent and his wife and three children. Then the snow by the tip of his skis began to move, and soon out of the smooth snow came his wife's head, pushing her way out. Deep down under the snow they found the children still fast asleep under their warm reindeer skins, quite undisturbed by the fact that the blizzard had blown away the tent and had piled up snow on top of them.



SUMMER TRAVEL IN LAPLAND

In summer when there is no snow, the Lapps strap all their possessions, their tents and tent-poles, and even the babies in their cradles, on to the reindeers' backs. In some parts, too, the people ride their reindeer like ponies.

Many other native peoples, especially in Siberia, are reindeer breeders and herders. The country they live in is much like Lapland, and they live the same kind of wandering lives, depending on their herds of reindeer for almost everything they need.

At one time there used to be reindeer in Scotland, and men used to come across the seas to hunt them. But they hunted them until there were none left. Recently, a few more reindeer have been brought to Scotland and turned loose on the mountains. No one will be allowed to kill them all now, so perhaps they will gradually increase as fawns are born, and once again we shall have reindeer in Britain.

BEAVERS

INSTITUTE OF EDUCATION FOR WOMEN
1054
Dept. of Extension
SERVICE.
★ CALCUTTA-27 ★

A PAIR OF BEAVERS WITH THEIR YOUNG KITTENS INSIDE THE LODGE

BEAVERS

THE beaver is the only animal in the world that can alter the whole appearance of the country round its home and change its surroundings to suit itself. No other living creature, except man, does this.

A beaver is about 2½ feet long, with a tail another 10 to 12 inches long. It has a rich, dark-brown, rather hairy, fur coat, and its large head and very short legs make it look rather clumsy. Its tail, which is flat and hairless and shaped like a paddle, drags on the ground as it walks, but acts like a rudder when it swims; and its hind feet are webbed with skin between the toes to help it to swim. The beaver's front feet are like hands, and it uses them as hands rather than as feet.

Beavers belong to the same large family of animals as do rats and mice and squirrels and porcupines. They are called 'rodents', which means 'gnawers', because all the members of this family have very strong front teeth that are particularly good for gnawing through such hard things as wood and the roots of plants. The beavers are one of the largest of the rodent family, and they are by far the most intelligent. Not any of the others are very intelligent.

Beavers can live wherever there are flowing rivers

NORTH AMERICA

and streams and plenty of trees that are green in summer-time and bare in the winter, for they feed on the bark of such trees.

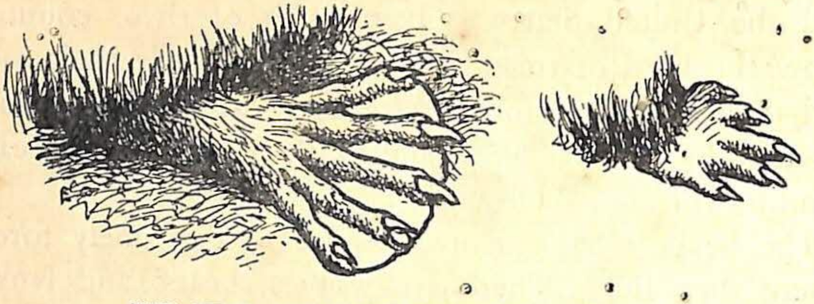
Beavers used to be found in all the northern countries of the world, where the weather is neither very hot nor very cold, and where trees grow well. A long while ago they were quite common in England and in most countries in Europe; but now there are no wild beavers in the British Isles, though there are still a very few in some parts of Europe and Russia.

But by far the greater number of beavers in the world today live in the continent of North America—in Canada and the United States. Over much of these countries grow the kind of trees that beavers need for their food, and there are great forests stretching for mile after mile, broken by broad lakes and with rivers and streams winding through them.

The beavers have many enemies in the lonely forests where they live. There are wolves, bears, and lynxes, which are like very big, short-tailed cats. In the mountains there are pumas, often called 'Mountain Lions' because they look rather like small lions; and in the plains there are coyotes, which are like small wolves. In the rivers there are otters who often seize and eat young beavers. Eagles and great horned owls also sometimes swoop down on a baby beaver and fly off with it.

The beavers themselves are most peaceful animals, and not at all good at defending themselves. Their sharp, chisel-like teeth can give very nasty wounds if they choose to use them, but they do not often try to defend themselves. If a beaver is attacked on dry land and cannot escape into the water, it usually puts up very little fight against its enemy.

THE HEAD OF A BEAVER



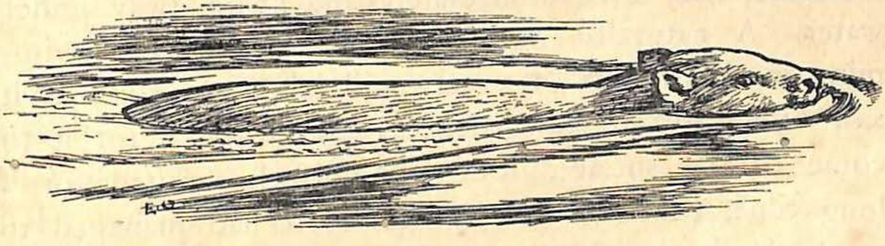
THE HIND AND FRONT PAWS OF A BEAVER

But though they are usually such timid animals, beavers are very brave in the defence of their kittens (as the babies are called). They will often turn an enemy's attention away from the babies by themselves pretending to be injured and limping off as though they were an easy prey. Then, when they think they have drawn the enemy far enough away from the kittens, they quickly dive to safety. So strong is their instinct to protect the young ones of their own kind that beavers have even been known to risk their own lives to rescue the kittens of other families that are not related to them.

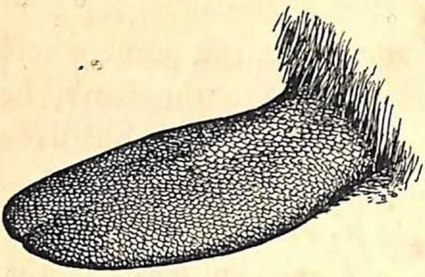
Beavers move very slowly and clumsily on land. They waddle about on their little short legs with their backs arched and their large, flat tails dragging behind them. But they can sit up straight, using their tails to support themselves and leaving their hands free, and when they are carrying things they often walk upright on their hind legs, slowly and very steadily, for quite a distance.

A BEAVER WALKING UPRIGHT CARRYING MUD IN ITS FRONT PAWS

But beavers are not at all slow or awkward when they are swimming in the water. There they are perfectly at home, for their bodies are beautifully shaped for moving easily through the water. They do not use their front paws in swimming, but, if they are not carrying anything, keep them tightly tucked under them. Their large, webbed hind feet are quite able to do all the work. Beavers swim very low in the water, showing nothing above the surface except their faces and a small part of their backs. They can dive without a sound or a ripple to show that they are there.



A BEAVER SWIMMING



A BEAVER'S TAIL

Beavers use their tails mainly as steering-oars to help them to turn quickly in the water, but also sometimes as extra paddles to help them move forward very fast in an emergency. They also use their tails to give warning of danger; for example, if a beaver slaps water with its tail as it dives, that is a warning to other beavers that danger is near. The wide tail as it strikes the water makes a resounding clap that can be heard a long way away in the silent woods; and it also raises a great shower of spray, which may sometimes serve to baffle and delay any enemy making an attack, and so give the beaver an extra moment in which to dive to safety.

Beavers take long, slow breaths, as seals do, and so they can swim a long way under water without coming up to breathe. When they seek safety in the water, therefore, they dive immediately and swim away under water. A naturalist once came upon a beaver swimming in the middle of a very still lake. As soon as it saw him it dived, and he kept careful watch for it to come to the surface. But, although he waited for a long time, he never saw it again. It had managed to reach the bank without coming to the surface. When the naturalist measured the distance from the point where the beaver dived to the nearest point on the bank, he discovered that at the pace a beaver swims it would have taken the beaver at least 10 minutes to reach the bank—and all that time it must have held its breath.

Beavers are the most stay-at-home animals in the world. For all their 15 or 20 years of life they hardly ever wander more than a mile from their home. The only time a beaver may wander far is when it is looking for a mate. Sooner or later, when it finds its mate, they will set up house together, staying with each other for the rest of their lives; for beavers are very faithful, affectionate animals. Naturalists do not think that beavers often have more than one wife, and the Red Indians say that if a beaver is killed, its mate lives alone for the rest of its life and never looks for a new mate.

Beavers living alone usually make a home in a hole in the bank of a river or lake. Sometimes a whole family will live in one of these bank-burrows, as they are called. But most beavers build themselves houses, called 'lodges'.

A pair of young beavers about to set up house choose a site for their home where there is a good supply of food-trees close to a stream of running water. Beavers, as we know, are never satisfied unless they are close to water in which they can swim. So before they build their lodge they set to work to turn the stream into a pond deep enough never to dry up in the droughts of the driest summer or freeze right to the bottom in the frosts of the coldest winter. Beavers know by some sure instinct just how deep this pond must be and how to set about the work of making it.

To make the pool the beavers begin by building a dam across the stream at a suitable place. With their sharp teeth they set to work to cut down trees for their dam. A beaver can gnaw through a tree which measures 8 inches across, though many that they cut down are not so big. Then they cut up the trees into pieces which they can manage, drag them into the stream, and leave them with their branches pointing downstream and the stumps upstream to form a loose fence across the stream. Then they bring a great mass of smaller sticks and rushes and stones to fill up the holes, and finally they plaster the whole fence over with a thick covering of mud. This turns the fence

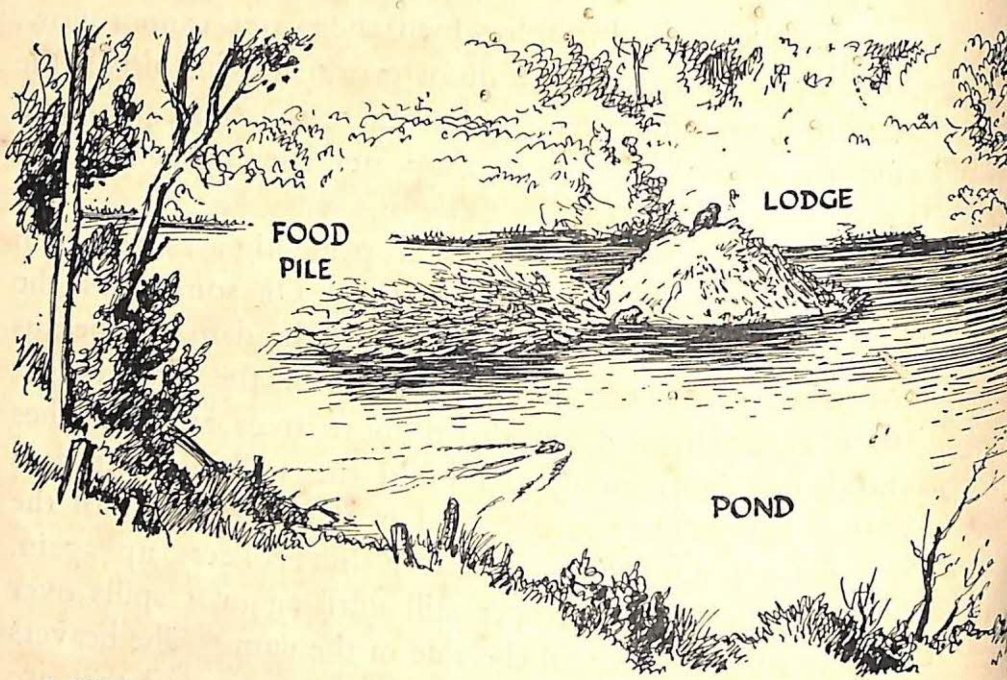
A BEAVER CUTTING DOWN A TREE

into a solid wall through which the water cannot flow. Then the water, since it cannot go on flowing down the stream, begins to collect. Soon there is a small pool, and this grows into a pond, as the water rises up against the upper side of the dam.

Before long, the water rises up as high as the dam and begins to flow over the top. Or sometimes the water finds a way round the sides of the dam and begins to run down the valley again. Then the beavers get to work again and cut down more trees and branches and bring more mud, and build the wall of their dam higher still. They also extend it at either end until the water no longer flows round it but collects up again. So the pond grows deeper still until again it spills over the top or comes round the side of the dam. The beavers go on making their dam higher and longer until they are quite satisfied that their pond is deep enough. Then they stop, and let the rest of the water spill over and run down the valley.

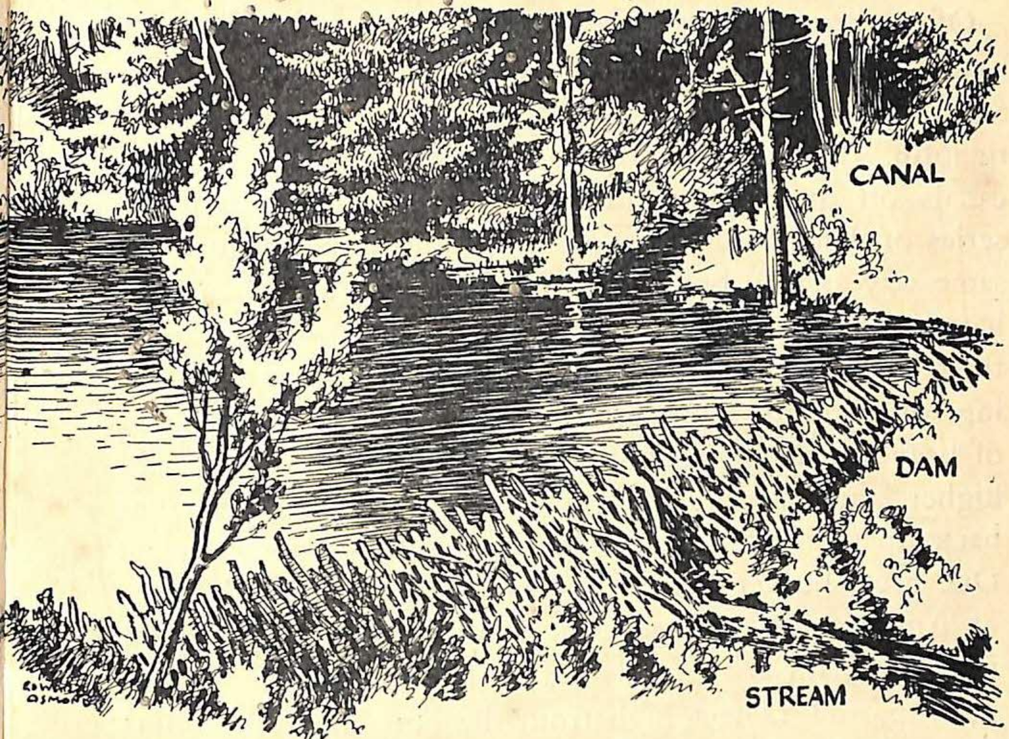
Now the beavers know that if they build their lodge in this pond or on the bank they can dive into deep water when their enemies are about; and they are sure that the entrances to their lodge will always be deep down in the water and never blocked by ice in the winter.

Beavers are not only much more comfortable and



A TYPICAL BEAVER-POND, SHOWING LODGE, FOOD PILE, DAM, AND CANAL

feel much safer in the water than on the land, but it is much easier for them to float a log on the water than to drag it across dry land. So they always cut down first the trees which are on the water's edge so that they can easily pull the logs and branches into the water. When these are all used, they may build the dam up higher, and then the pond above the dam will stretch farther across and up the valley, bringing more trees



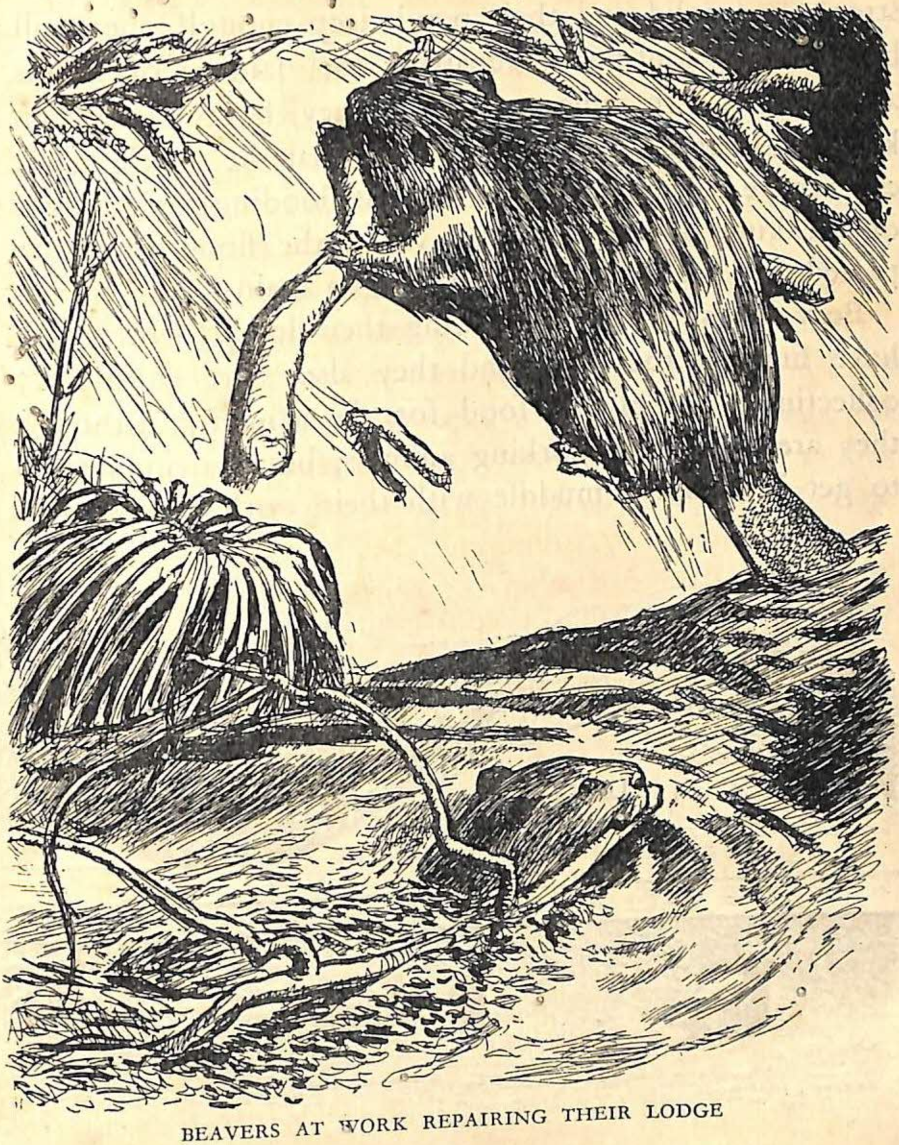
close to the water's edge. This lightens the beavers' work a great deal.

When there are no more trees near the banks of the beaver pond, the beavers sometimes dig canals leading from the pond to more distant trees. These canals are usually about 3 feet wide and 2 feet deep, but here and there the beavers make deep pools in which they can take refuge from danger.

Often the canals are only a few yards long, but beavers have dug canals as much as a quarter of a mile long, and they always take the most direct route to their destination. In hilly country they may have to make the canals on quite steep hills. In this case they build a series of dams to hold the water on the slope, in just the same way as men build locks in their canals. When they have made their canals, they can swim to and fro to their work and float their sticks and logs instead of pushing or dragging them across dry land. Generations of beavers will go on building the same dam bigger and higher and making the pond above it extend farther back up the valley, sometimes for as long as 100 years. One great beaver dam in the north of the United States of America has reached over ¼ mile long, and in some parts the dam is 23 feet wide at the base, 5 feet wide at the top, and 14 feet high from the bottom of the pond. Many generations of beavers have made this dam, for to build a dam of this size beavers have had to carry several hundred tons of wood and soil.

Sometimes, instead of increasing their original dam beavers prefer to build other dams above and below their pond. Then, instead of having one very large pond they will have a whole string of smaller ponds up and down the river.

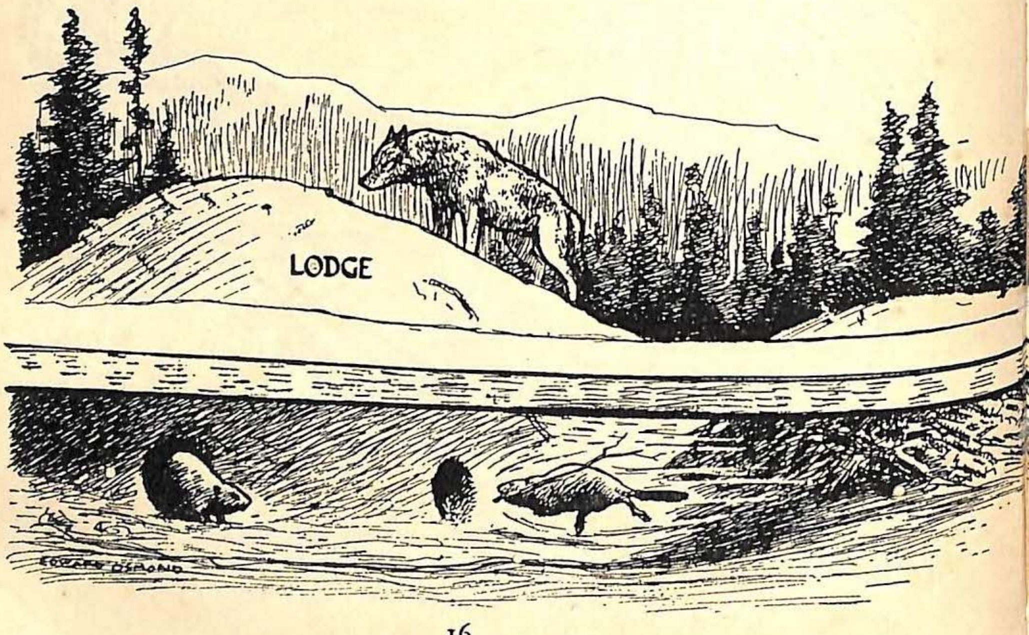
Even after the beavers are satisfied that their dam is



BEAVERS AT WORK REPAIRING THEIR LODGE

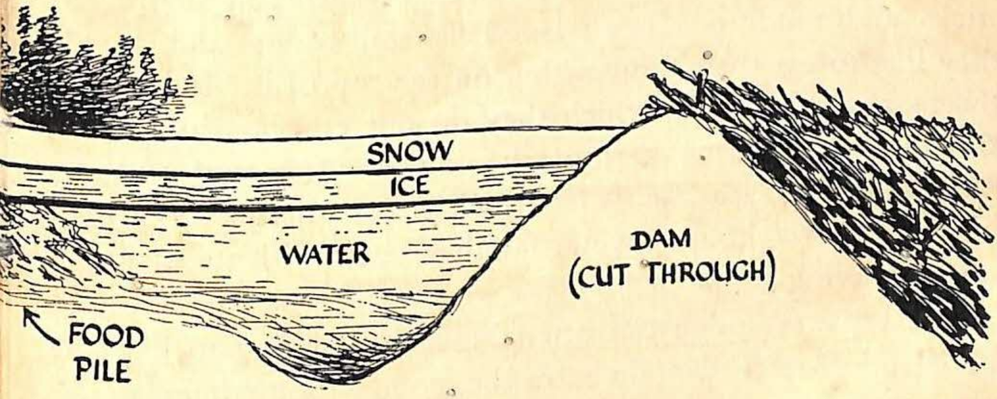
strong and solid and their pond deep enough, they still have to be continually repairing the damage of floods and storms. In times of flood they have even been known to cut a gap in their dam so that the raging water can escape down the valley without flooding their lodges or breaking down the dam. When the flood-water has passed, the beavers will fill up the gap again.

Beavers usually start building their lodge before they have finished the dam, and they also start quite early collecting a supply of food for the winter. Although they are such hard-working animals, beavers often seem to get in rather a muddle with their work; they often

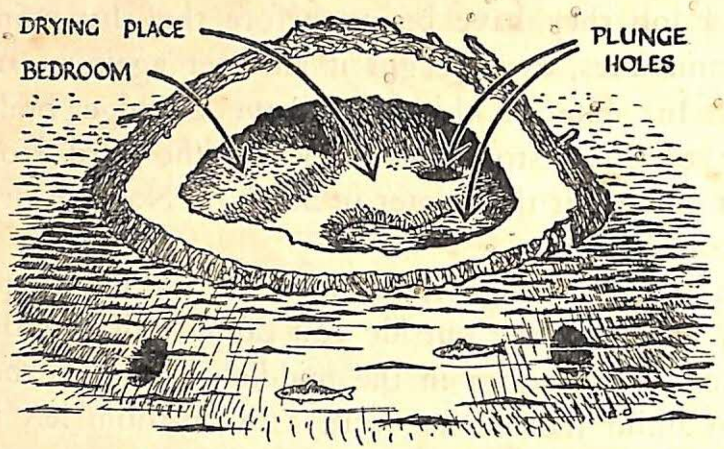


leave a job they have begun before they have finished, and sometimes, even, begin it all over again in another place. In spite of this, they have a lodge built and plenty of food stored away before the hard frosts of winter come, for the winter in much of North America is very cold indeed.

The beavers' lodge looks like a great untidy pile of sticks, and from the outside you cannot tell that there is a hollow living-room in the middle of it. The beavers do not build their house with a living-room left in the middle; but, when the heap of sticks has grown to a good size, they gnaw away the sticks in the middle till



SECTION THROUGH A BEAVER POND IN WINTER. A BEAVER, SAFE UNDER THE ICE, IS COLLECTING A STICK FROM THE FOOD PILE, WHILE A WOLF SNIFFS AT THE TOP OF THE LODGE ABOVE THE ICE



A BEAVER'S LODGE CUT OPEN

they have made a room. Then, as the family grows bigger, they gnaw away more of the walls to make the room bigger too. They are always adding more sticks to the outside of the lodge, so that it is always growing both higher and wider. They keep on bringing more sticks and mud to renew the walls and roof; and as they like to eat their food sitting on the top of the lodge, the parts of the sticks which they do not eat stay on the roof and so become part of the lodge. The roof and walls of a lodge are often 3 feet thick or even more. Very big lodges will house several families, each with its own separate living-room

The beavers' lodge can often be seen standing up like an island from the middle of the pond. Sometimes it is built against the bank or as part of the dam, and sometimes on dry land. The beavers lay a foundation on the bottom of the pond, which may be as big as 12 feet square. Then they build up solidly with logs and stones and mud till the platform has reached a few inches above water level. On this platform they build the lodge.

The lodge is entered by a tunnel which leads from deep down in the water of the pond up to a hole in the floor of the living-room. Beavers usually make more than one entrance tunnel, so that if some enemy comes up one of them the beavers can escape down another. The holes where the tunnels come up through the floor are called plunge-holes, as they are always full of water.

When beavers come up into the living-room through a plunge-hole they are very particular about grooming themselves thoroughly. The first part of their room is like an entrance hall, and they always wait there combing and drying their fur until the water has all drained out; then they move on to the other part of the living-room, which is raised up a little higher. In this the beavers have their bed of dried grass or shredded wood, which they are always careful to keep quite dry.

As a rule the beavers keep a pile of food twigs inside the lodge in a special place—often in front of the main entrance to the lodge. As well as this they have a main store of winter food on the bottom of the lake. Beavers live mainly on the bark of trees. Poplars are their favourite food, but they also like alders, willows, birch, cotton-wood, wild cherry, and many others—but not firs and pines. They eat the inner bark in which the sap runs up the tree from the roots. In summer, besides the bark of trees, they eat grass, water-lily roots, berries, mushrooms, rushes, and other things.

As the first hard frosts of winter set in, the beavers usually plaster the lodge with wet mud, often several inches thick. This mud freezes hard, making a solid wall, like concrete. It helps to make the lodge warm, and it also makes the lodge very strong. When the pond is covered with thick ice, wolves and foxes and lynxes can walk on it right up to the lodge. They can smell the beavers inside, and as they are usually very hungry in the winter, they would very much like to break into the lodge and eat them. But even their strong claws cannot break through the outer wall of hard, frozen mud; and so the beavers stay safe and snug all the winter.

The beavers' lodge looks just like any other mound of snow. But sometimes a hunter will notice that a little cloud of steam is rising from the top of one of these mounds. This is the warm breath of a family of beavers rising through a small ventilation space in the roof of the lodge which is left free from the covering of mud.

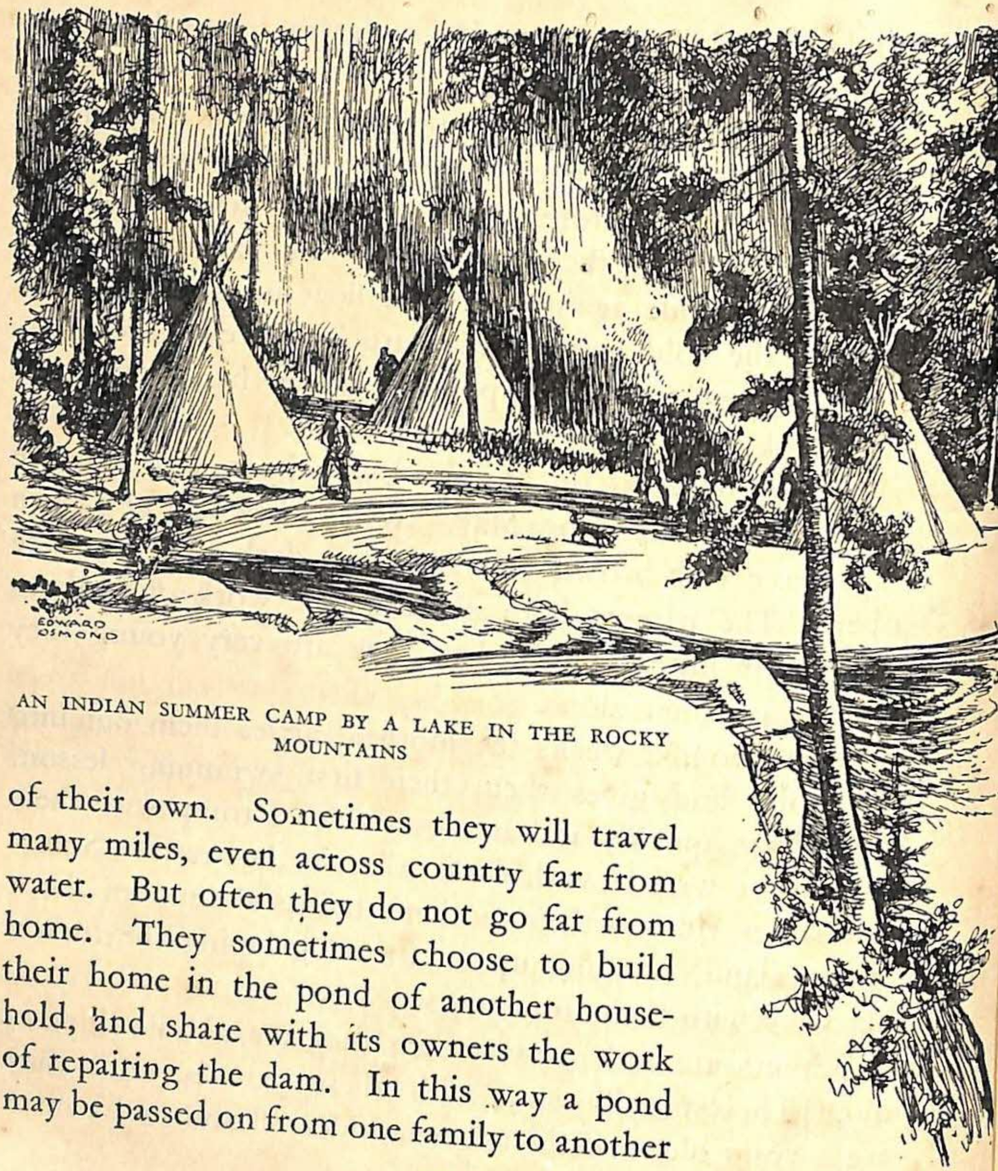
And so the hunter knows that under the mound a family of beavers is living.

Beavers do not work in the winter, but stay inside their lodge. Whenever they are hungry they swim out to their food store in the pond and fetch in a stick to gnaw. When they have eaten the bark they carry the stick outside again and let it float up under the ice. During the cold weather they are hardly ever seen outside. Indeed, when the pond is frozen hard, they cannot break through the ice to get out.

Young beavers, or 'kittens', are born four or five at a time in April or May. When they are new-born they have soft brown fur, and their dark eyes are wide open. The parents both share in the work of looking after their kittens, and when they are very young they never leave them alone.

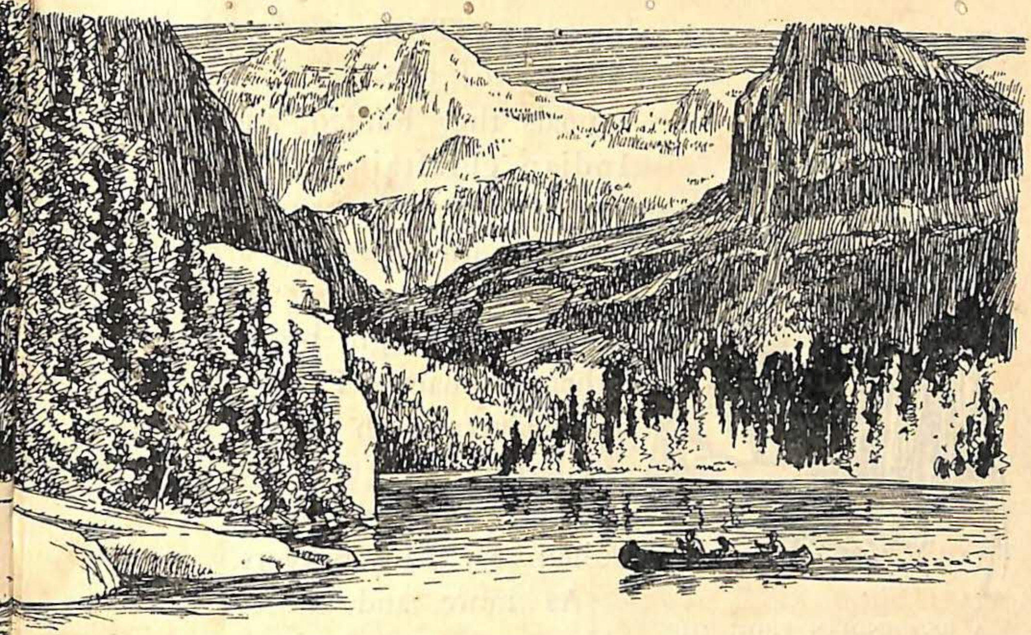
After about 4 weeks the mother carries them out into the pond and gives them their first swimming lesson. They learn quickly and are soon able to romp with their parents or wrestle with each other in the water. Sometimes they ride on their mother's tail as she moves about on dry land, standing up on it and gripping the fur on her back with their front paws.

Beavers are full grown when they are about 2½ years old. They usually stay with their parents until they are 2 years old, and then they wander off and find a mate



AN INDIAN SUMMER CAMP BY A LAKE IN THE ROCKY MOUNTAINS

of their own. Sometimes they will travel many miles, even across country far from water. But often they do not go far from home. They sometimes choose to build their home in the pond of another household, and share with its owners the work of repairing the dam. In this way a pond may be passed on from one family to another



and remain in use as long as there are enough trees in the neighbourhood to provide food and building materials.

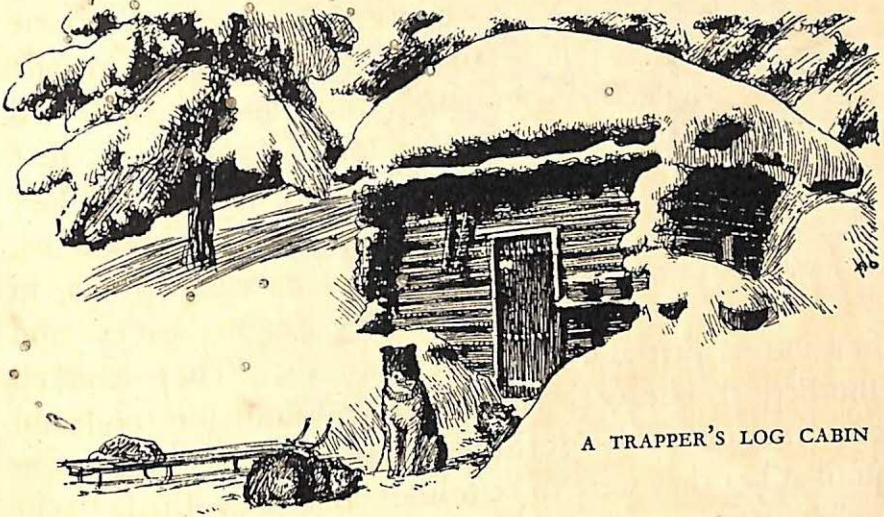
The beavers' warm fur coats are very valuable. The men who hunt for furs in North America are called 'trappers'. Some of them are Red Indians and some White Men. When White Men first went to explore North America, about 350 years ago, they found Red Indian hunters living in these lands. The Red Indians lived most of the time in tents, called wigwams, so that they could move easily from one place to another when

A RED INDIAN FROM THE CANADIAN FOREST REGION

hunting. They made their clothes of the skins of the animals they hunted, and Red Indian chieftains wore fine feather head-dresses. They hunted with bows and arrows, and they made clever traps, in which they caught beavers and other animals. They cooked the beavers' flesh for food and used their skins to make warm clothes. But they hardly ever killed very many beavers.

As more and more White Men came to North America, they began to settle in the lands where the Red Indians lived—indeed, they often drove the Indians away. These White settlers did not often need the beavers' flesh for food, but they wanted their skins, because they could send these back to England and sell them for a lot of money. In those days beaver fur was fashionable, and people would pay high prices for the skins. The White settlers therefore tried to kill as many beavers as they could, so as to get rich quickly.

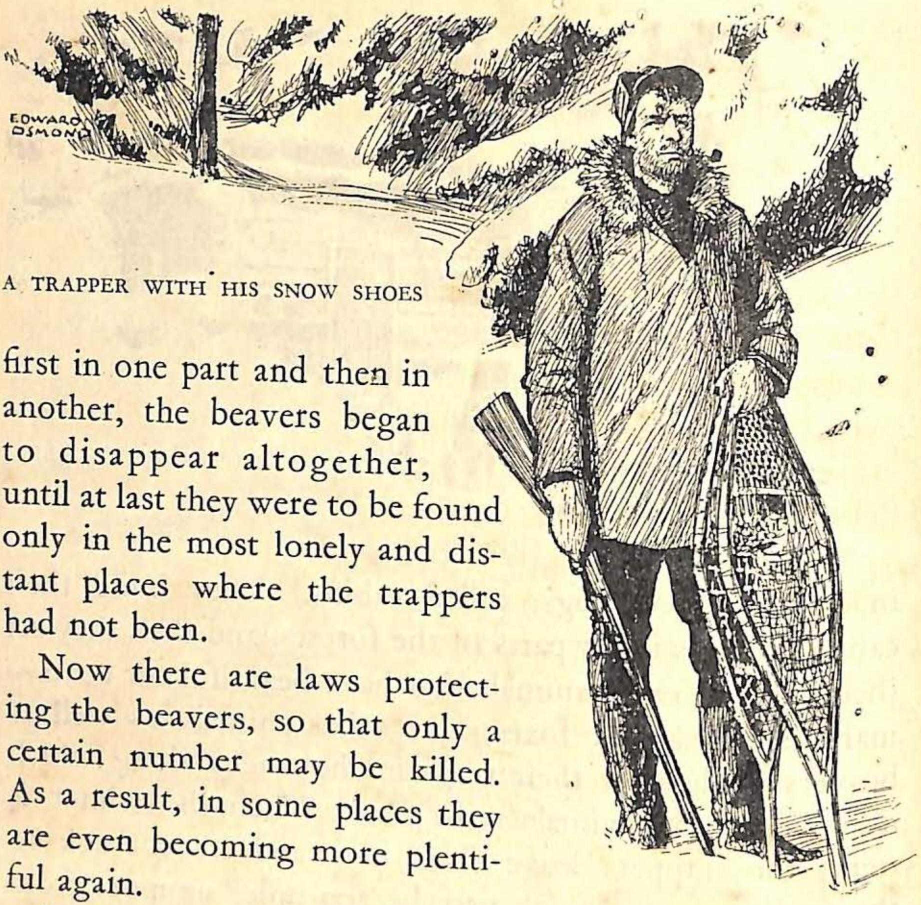
For 7 or 8 months every year the trappers live alone



A TRAPPER'S LOG CABIN

in huts made of logs, called cabins. They build their cabins in the wildest parts of the forests, and then they set their traps to catch animals that have beautiful fur coats—martens, musk-rats, foxes, and other animals as well as beavers. They set their traps in the tracks along which they know the animals will pass. When the winter is over, the trappers leave their huts and travel back to the trading posts, which may be 200 miles or more from their hunting grounds. Trappers always work in the winter rather than the summer because in the winter the animals are carrying much thicker, finer coats than in the summer.

In the past the trappers caught so many beavers that,



A TRAPPER WITH HIS SNOW SHOES

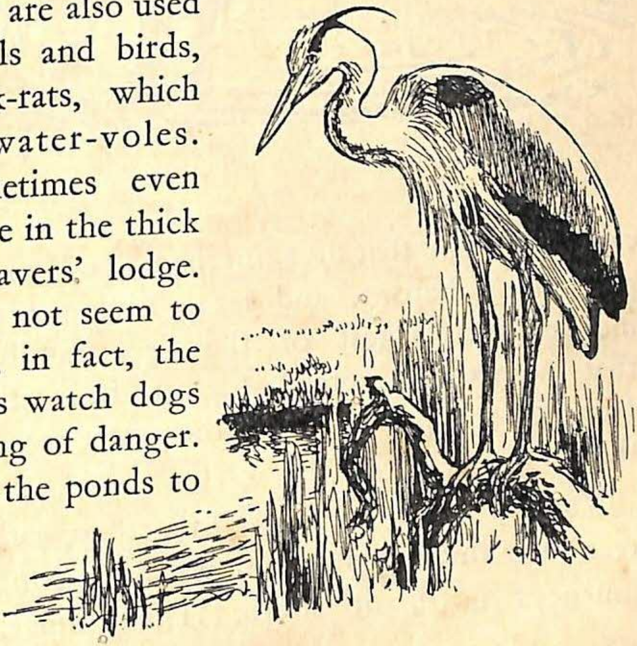
first in one part and then in another, the beavers began to disappear altogether, until at last they were to be found only in the most lonely and distant places where the trappers had not been.

Now there are laws protecting the beavers, so that only a certain number may be killed. As a result, in some places they are even becoming more plentiful again.

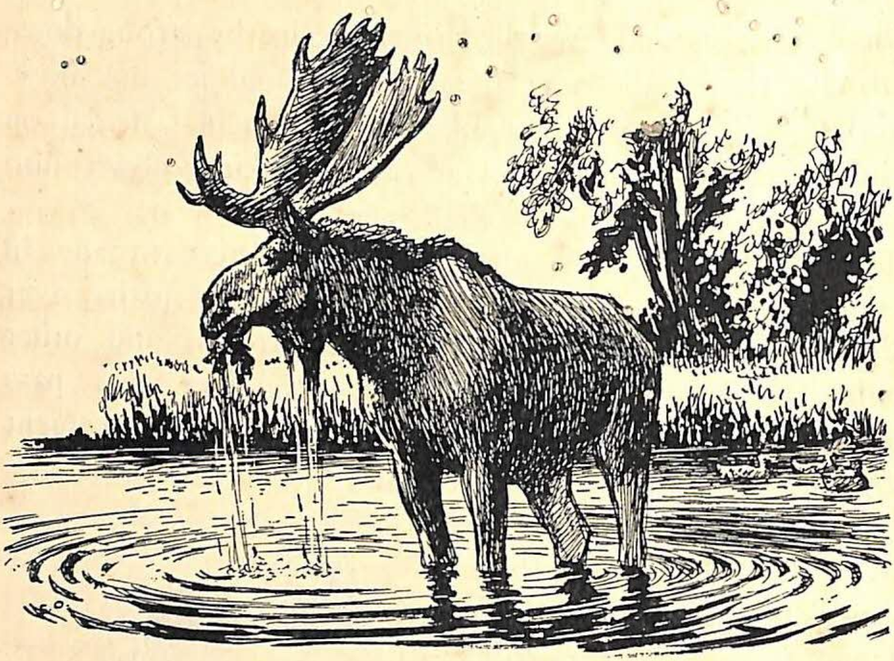
In these northern forests people usually travel along the rivers and across the lakes because these are much the easiest passages through the forests. Very few roads have been made. In summer the travellers use canoes; but in winter, when thick ice covers the water, they either ride in sledges pulled over the ice by strong dogs, or else they walk over the snow-covered ice on snow-shoes. These are rather like tennis-rackets fastened on their feet, and they prevent their sinking down into the deep snow.

A beaver dam is often a kind of cross-roads in the forest. The beavers themselves make paths over them as they move up and down stream, and other animals swimming up or down the river also pass over them. The land animals use them as convenient bridges for crossing the streams.

Beaver ponds are also used by other animals and birds, especially musk-rats, which are large water-voles. Musk-rats sometimes even make their home in the thick walls of a beavers' lodge. The beavers do not seem to mind this, and, in fact, the musk-rats act as watch dogs and give warning of danger. Otters come to the ponds to



A BLUE HERON

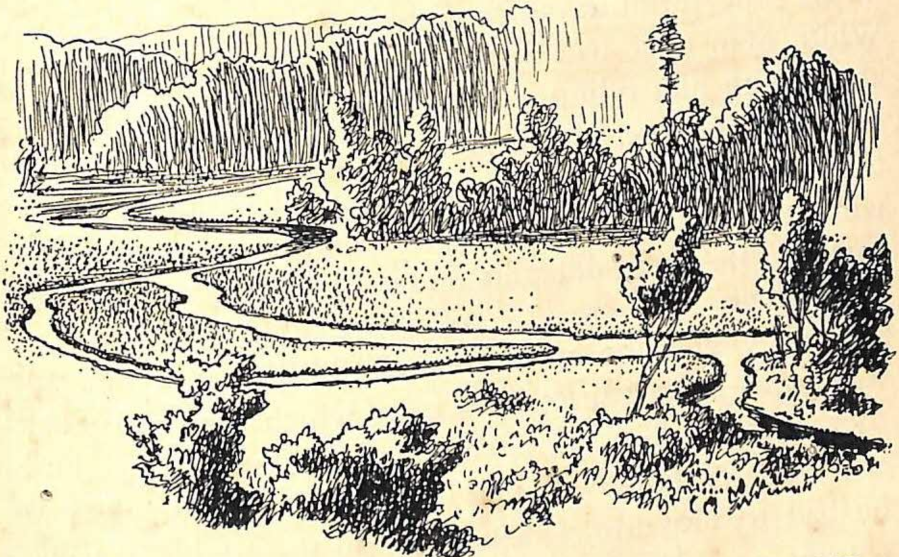


A BULL MOOSE

catch the fish that live in them, and so do kingfishers, great blue herons, and large diving birds. The great moose, the largest of the deer family, with antlers that sometimes spread 6 feet from tip to tip, also come to the ponds to eat the water-weeds that grow in them.

Various kinds of duck come there either to nest and rear their ducklings or simply to rest for a while on their journeys north or south. The clumsy looking mudhens wade about among the reeds that grow near the banks.

When a very old beaver pond is finally abandoned by the beavers, and the dam is allowed to break down, the water of the pond drains away down the stream, leaving the floor of the valley much higher than it was before the beavers first came to it. It is covered with rich river mud which the stream is always bringing down with its water. When the water was held up by the beavers' dam and spread out into a pond, the mud sank to the bottom. As more mud came down year after



GRASSY MEADOWS ON THE SITE OF AN ABANDONED BEAVER POND year, the floor of the pond slowly grew higher and flatter. So when the water is drained away, a wide expanse of rich soil is left. When this has had plenty of time, perhaps several years, to drain, it makes very good grass land. Indeed, some of the best meadows where cattle now graze are the result of the hard work of generations of busy beavers many years ago.

Beavers make delightful pets. The Red Indians often take young beavers home and give them to their children as pets. The only drawback is that, since they must keep using their chisel teeth, they are inclined to gnaw through the legs of tables and chairs and to 'cut down' the furniture as though it were forest trees. A White Man once had a tame beaver who used to travel about with him riding in a basket on the back of a pack-horse. Whenever the man began to pack up his camp to move on, the wise little beaver stood beside the horse with its front paws raised up, asking to be put into the basket. It often did this long before its master was ready to go.

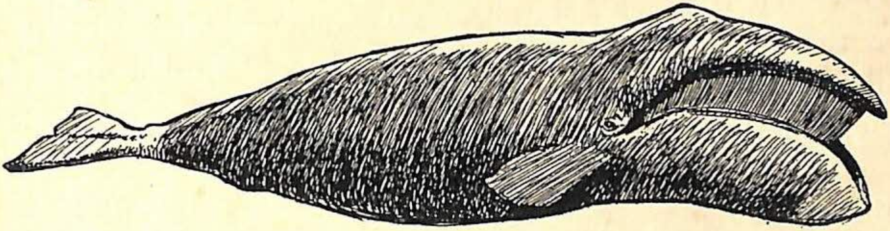
Grey Owl, who writes wonderful books about animals, tells many stories of beavers which show how hard they work and how, once they have started to build anything, nothing will put them off. On one occasion he had to move to a new home just as the winter was coming on. He took with him his family of pet beavers,

AN INDIAN GIRL WITH A PET BEAVER

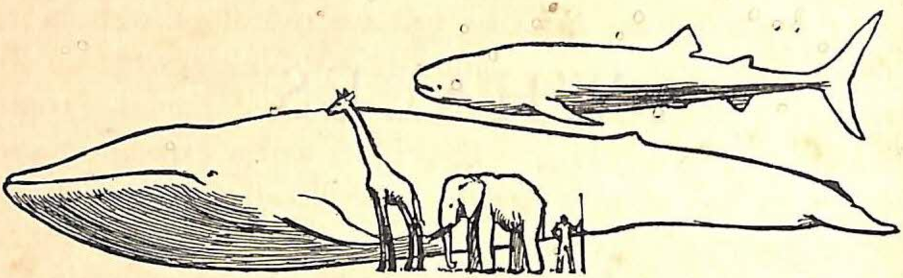
but the beavers had no time to build themselves a lodge in their new home before the hard frost set in. So Grey Owl shared his own cabin with them. The beavers had a way out down through the floor of the cabin into a passage leading to the lake near by, and Grey Owl himself had a door leading out to the snow-covered forest outside. They all lived happily like this; but there was a draught coming in under the door which the beavers did not like. So to stop this draught they took to making constant journeys to the bottom of the lake and coming back with armfuls of black mud; this they used to stuff up the crack at the bottom of the door.

But this meant that Grey Owl could not open the door without clearing away a great heap of mud; and as soon as he had cleared it, the beavers went off to fetch some more to put in its place. At last Grey Owl realized that the beavers would never get tired of fetching more mud; so he sawed the door in two. The bottom part he left shut with the heaped-up mud always in position, and he just stepped over this when he went in and out through the upper part.

WHALES



A GREENLAND WHALE



A BLUE WHALE COMPARED WITH A GIRAFFE, AN AFRICAN ELEPHANT, A MAN, AND A WHALE SHARK, THE LARGEST FISH KNOWN

WHALES

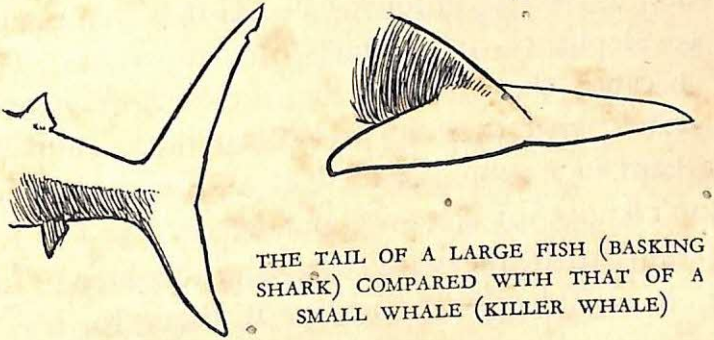
A WHALE is not a fish, although it spends all of its life in the sea as a fish does. It is a warm-blooded animal like many of the animals that live on the land, such as elephants, and dogs, and human beings.

Fish breathe water and are cold-blooded, and most of them lay eggs. But the warm-blooded land animals such as horses and elephants not only breathe air but their babies are fed on milk provided by their mothers. These animals are called 'Mammals'. Whales, too, are mammals because they breathe air and feed their babies on their mother's milk.

Once, millions of years ago, the ancestors of whales used to live on the land like other mammals; but for some reason that we do not know they took to swimming in the water. They spent so much time in the water that their front legs gradually became flippers, very much like the fins of a fish, because these were more useful for swimming; and their back legs gradually shrivelled away because they never used them. People who have studied the bones of a whale can find little bones in the whale's body which are all that are left of what must once have been their hind legs, and the bones of their flippers are still much like those in a man's hand.

Instead of legs, whales have developed tails with great 'flukes' on either side, which are very useful for swimming. These flukes make a whale's tail look much like the tail of a fish, but whales' tails spread across from side to side, while fishes' tails are upright. A whale uses its side flippers for steadying itself in the water, and its great tail flukes for driving forward through the water.

A whale's skin is quite smooth. Probably, when they used to live on the land, they had hairy coats, like those of polar bears or seals. But a hairy coat would be a

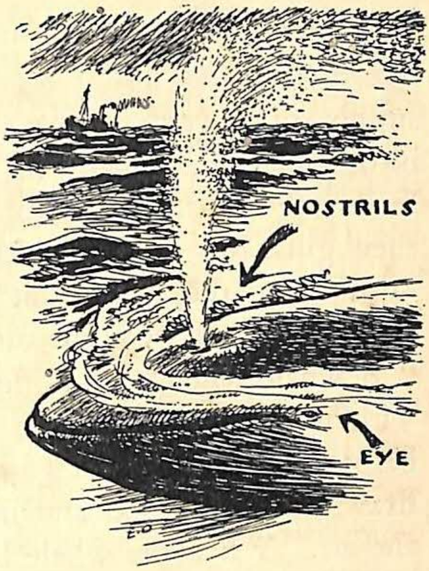


THE TAIL OF A LARGE FISH (BASKING SHARK) COMPARED WITH THAT OF A SMALL WHALE (KILLER WHALE) great disadvantage to an animal always in the water, and all that is now left of this hairy coat are a few bristles round the whale's mouth. But as most whales live in cold, icy seas, they need something to keep them warm. So instead of fur a whale has a blanket of thick, oily fat, called 'blubber', under his skin, perhaps as much as 1 foot thick. This is just as warm as a fur coat, and as fat is very light, the blubber makes the whale float easily in the water.

A whale's body, which is long and stream-lined, is exactly the right shape for passing smoothly through the water. The whale's face is very different from most animals' faces. Its nostrils, instead of being at the tip of its nose, are up on the top of its head so that they can keep clear of the waves and spray in a rough sea. They have flaps over them, so that the whale can keep its nostrils tight shut when it is under water. Its eyes, on the other hand, are low down near the corner of its mouth.

It is not as easy to study whales as it is many animals, such as elephants and camels, for instance. This is partly because they live in the sea and we cannot so easily watch what they do as we can those animals that can be kept in a zoo. So there is a great deal which we still don't know for certain about whales.

We think that they are very short-sighted; indeed, long sight would not be much use to them, for it is never possible to see any great distance under water, even close to the surface. They almost certainly have no sense of smell or very little. Their nostrils simply serve as 'blow-holes' for breathing.



THE HEAD OF A WHALE

Whales, however, in spite of neither seeing nor smelling very well, can find and keep in touch with each other perfectly easily. Most probably their keen hearing is their means of doing so. Any loud, sudden noise will startle them. It is remarkable that they can hear so well, for a whale's ear is only a small hole, less than half an inch across.

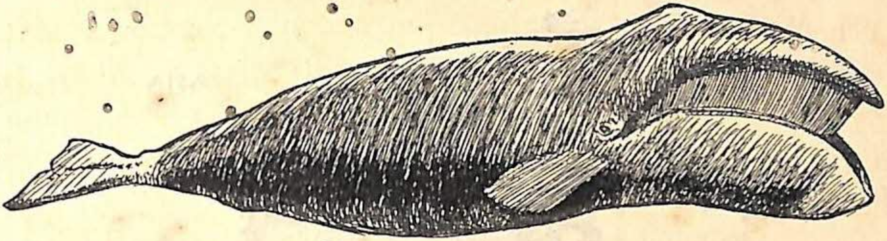
Whales live the same kind of life as a fish, and their food is usually some way below the surface of the sea—in some cases a very long way down. Yet they must be able to reach the air to breathe, like a land animal. So that they can spend a lot of their time far from the air, they have a very unusual way of breathing.

All living things must have 'oxygen' in order to live, and this oxygen is found both in the air and in water.

When we draw air into our lungs the oxygen mixes with our blood, and unless we could go on getting a fresh supply of oxygen as we breathe, we should die. All birds and land animals take oxygen from the air; but all fishes take it from the water which they 'breathe' with their gills, just as we breathe air with our lungs. Fishes 'drown' if they come out of the water into the air, just as we drown if we come out of the air into water.

A whale when it dives down deep in the sea, must take with it enough oxygen to last it a very long time. So before it dives it takes a great many deep breaths and so draws into its blood and muscles plenty of oxygen from the air. When the whale breathes out warm air into the very cold surrounding air, its breath condenses, just as our breath does on a cold day, and looks like a 'spout' of fine mist. This can be seen from a long way away, and sailors say that the whale is 'blowing'. After a number of these deep breaths one after another a whale has taken enough oxygen into its blood to last it long enough to do quite a lot of feeding below the surface. Some large whales can stay down in the darkness of the ocean for as much as an hour or more before they have to come up for more air. In the end, however, they must come to the surface again, or they would drown, just as we should.

Thus a whale spends most of its time first breathing



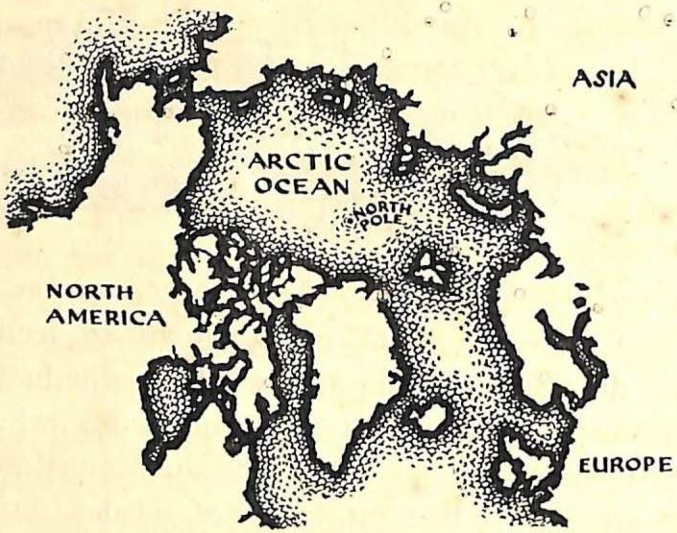
A GREENLAND WHALE

on the surface and then diving down to feed. One thing we do not know about a whale is whether it ever goes to sleep. No one has ever noticed a whale that appeared to be asleep.

There are many different kinds of whales; and they have also smaller relatives, the porpoises and dolphins. Together they make up quite a large family. The smallest dolphins are no larger than a man, but the biggest whales are the largest of all living creatures, many times larger than elephants. The blue whale, the largest of them all, sometimes grows to be well over 100 feet long, which is about twice as long as the largest kind of fish, the whale shark.

We will choose a few of the more interesting members of the whale family and describe each of them.

The Greenland whale is one of the Right Whales. They were given this name because, up to about 100 years ago, they were the right whales to hunt, as they were the easiest to catch and the most valuable.



THE ARCTIC REGIONS, WHERE THE GREENLAND WHALE IS FOUND

Men have hunted whales for hundreds of years. They needed their flesh—whale-meat—for food, and they used their blubber to provide oil for lighting and cooking. Before the invention of steamships, the whale-hunters went after their prey in large rowing-boats. These were launched from the shore or from sailing-ships that went searching across the oceans for whales to kill.

In those early days the Greenland whale was found in all the great seas in the cold northern part of the world; and whaling ships could sail out from British harbours and kill the whales without having to go a great distance. These early whalers preferred to attack the Greenland whale because it is a slow-moving, peaceful animal, and it could be easily overtaken by strong men in a rowing-boat. The Greenland whale is to be found only in the northern seas, and has never made its way to the cold seas of the far south, because to do so it would have to travel through the warm waters near the equator.

The Greenland whale is not the largest of the whales. It grows to be about 60 feet long, and about a third of its length is taken up by its enormous head. In fact, its great mouth is about 20 feet long.

As well as its blubber and flesh, the whale-hunters in the days of sailing-ships hunted the Greenland whale for the long, horny strips of ‘ baleen ’ or whalebone that it has instead of teeth in its mouth. This baleen is very strong, and at the same time it bends very easily. It is used for making corsets, and was very important in the days when ladies wore elaborate corsets to give them very narrow waists. In earlier days the gay plumes that floated from the helmets of knights as they rode in battles or took part in tournaments were made with whalebone.

Without this whalebone or baleen the Greenland whales could not collect their food, which consists of millions of very tiny sea creatures that drift in the ocean currents. These little creatures are much too small to be caught and bitten up with teeth, and huge whales need millions of them to make a meal. So instead of teeth, whales

A WHALE-HUNTER

have many long strips of baleen hanging, like a great comb, from their upper jaws, and forming a sort of sieve right across the whole length of their mouths. On the inside the strips of baleen have hairy fringes which prevent small creatures passing out through the baleen sieve. When the whale takes in a great mouthful of water, its tongue forces the water out again between the baleen strips; but all the small sea-creatures in the water are trapped by the hairy fringes inside the whale's mouth. The whale then swallows them before taking in another enormous mouthful of sea-water.

The Greenland whale is very timid, and when attacked it never tries to defend itself. The whale-hunters used to row their boat right up to it, and when they were quite close they would drive into it a barbed harpoon, a sort of spear with a long, thin rope attached to it. When the terrified whale dived to escape, the barbed head of the harpoon stuck firmly into its flesh. The whalers allowed the rope to run out while the whale dived, but as soon as its first panic was over they lashed the rope to the boat.

When the whale tried to escape by swimming away, the whale-boat was towed along behind it.

Often several boats would join in the chase, and more harpoons would be driven into the whale. At last the whale would become tired out, so that the whalers could kill it and tow its great body back to the ship to be cut up.

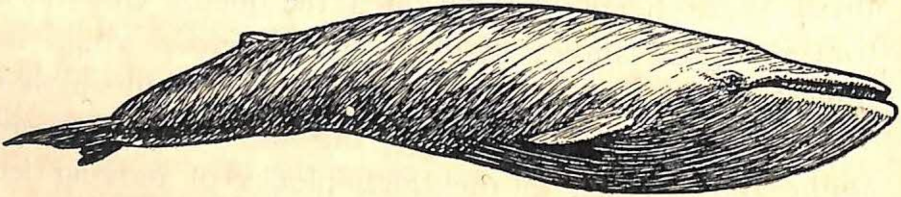
When the whalers had caught all the whales near their home ports, the whaling ships had to sail farther and farther north into the icy Arctic Ocean on hunting expeditions. The hunters made so much money out of the whales they captured that they were willing to face the terrible hardships of snow-storms, floating ice, and the bitter arctic weather. Their hunting was so successful that they gradually killed nearly all the Greenland whales, and now only a few are left in the coldest and loneliest seas of the far north-west.

Although the whales were mild and timid, whale-hunting was very dangerous, and hunters often lost their lives. In their fright the whales sometimes upset or smashed the boats and drowned the men. One blow from the great flukes of a frightened whale would be enough to throw a whale-boat high in the air and smash it to pieces. Sometimes, too, the big whaling ships were caught and crushed in the thick blocks of moving ice that form on those cold northern seas.

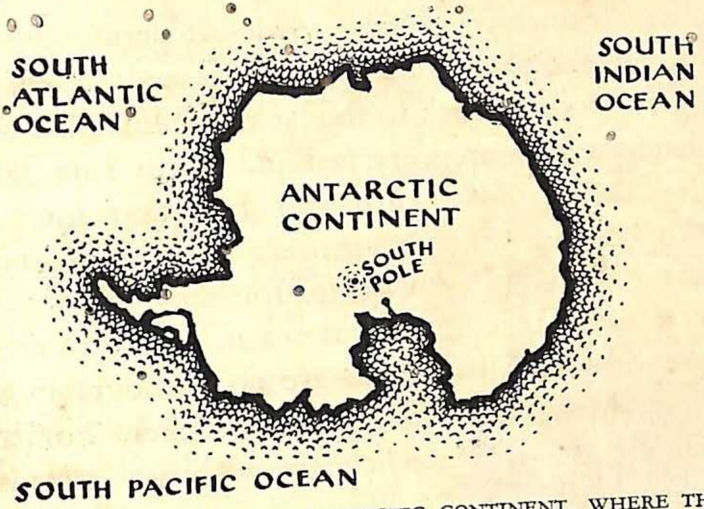
On one occasion a whale was harpooned near the edge of a thick sheet of ice, and it towed the whale-boat after it as it tried to get free. When the men saw it turn towards the ice they tried to cut the rope that was dragging them; but they were not quick enough. The whale dived under the ice, drawing the boat after it; and the boat with its crew of six men disappeared from view, and were never seen again.

The enormous blue whales are also whalebone whales. They get their name from their soft, slatey-blue colour. Although they are much longer animals, they have not nearly such large mouths as the Greenland whales. They have, however, a number of pleats in their throats, and so their throats can stretch in order to be able to hold great mouthfuls of water.

Blue whales have very streamlined bodies and, although they are so big, they move much more swiftly than Greenland whales. They moved too quickly for the old whale-hunters in sailing-ships and rowing-boats to be able to harpoon them easily. But now that whale-hunting is



A BLUE WHALE

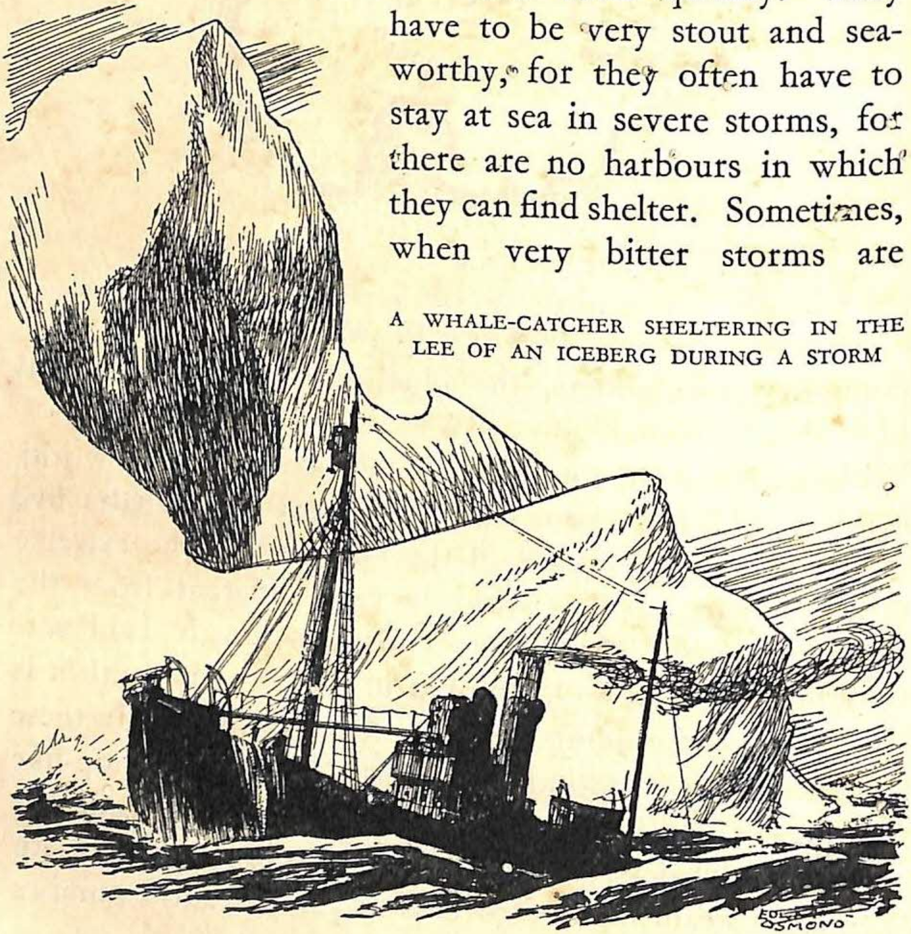


THE OCEANS ROUND THE ANTARCTIC CONTINENT, WHERE THE BLUE WHALE IS FOUND

done in fast steamers, the blue whale is most eagerly hunted.

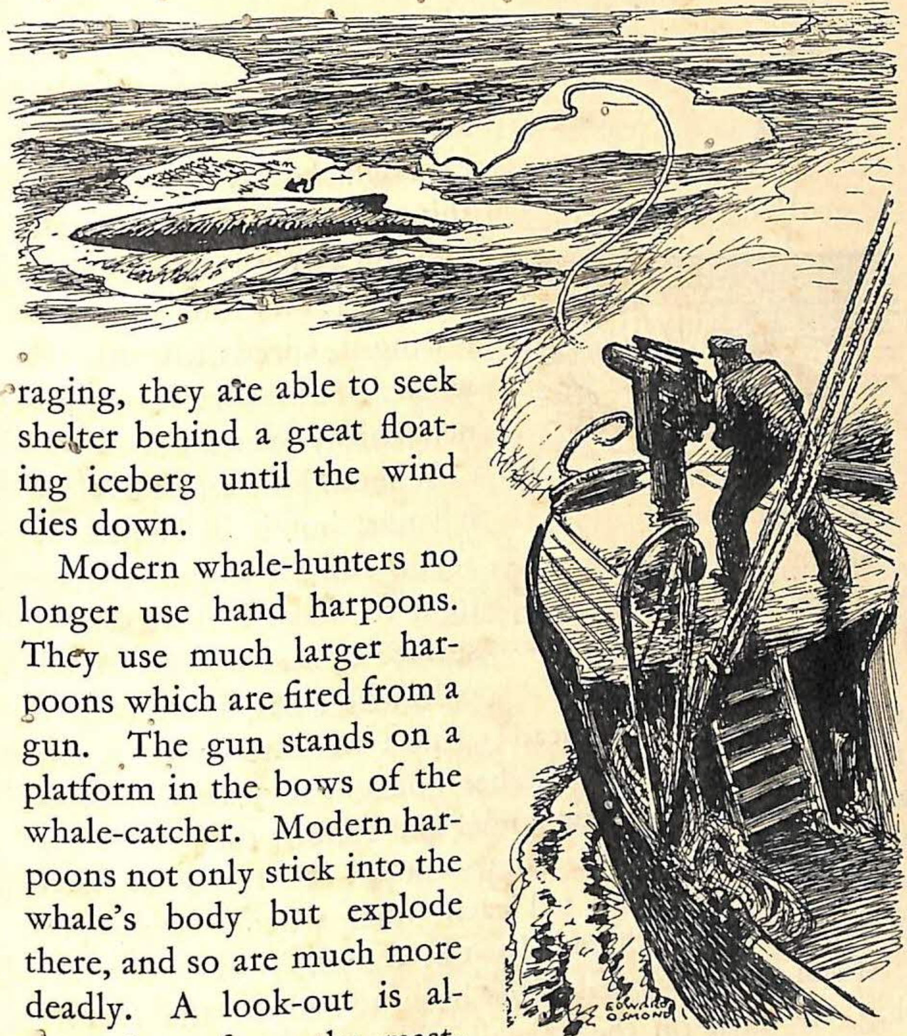
Blue whales are found in all the oceans of the world, in both cold and warm seas; but most blue whales live in the wide, cold oceans of the far south. The extreme northern part of the world is very different from the extreme south. The extreme north is mostly land surrounding the Arctic Ocean; but in the extreme south it is mostly sea surrounding the Antarctic Continent. In these cold oceans of the south live myriads of tiny shrimp-like creatures, called krill, on which the blue whales feed.

Modern whalers go out to hunt the blue whales with very large steamships called ‘ factory ships ’ and a number of smaller steamships called ‘ whale-catchers ’. It is the whale-catchers’ job to find the whales and to kill them ready to be brought back to the factory ships to be cut up. The whale-catchers are very fast and sturdy ships, able to turn and twist quickly. They have to be very stout and seaworthy, for they often have to stay at sea in severe storms, for there are no harbours in which they can find shelter. Sometimes, when very bitter storms are

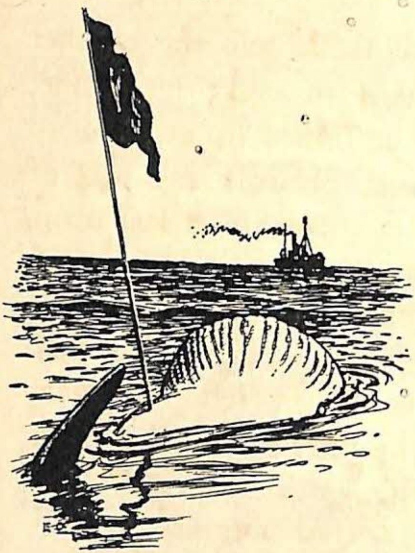


A WHALE-CATCHER SHELTERING IN THE LEE OF AN ICEBERG DURING A STORM raging, they are able to seek shelter behind a great floating iceberg until the wind dies down.

Modern whale-hunters no longer use hand harpoons. They use much larger harpoons which are fired from a gun. The gun stands on a platform in the bows of the whale-catcher. Modern harpoons not only stick into the whale's body but explode there, and so are much more deadly. A look-out is always kept from the masthead of the whale-catcher, and when a whale is sighted,



A HARPOON GUN FIRED AT A BLUE WHALE



A DEAD WHALE WITH A FLAG AS A MARKER. IN THE BACKGROUND THE WHALE-CATCHER IS STEAMING AWAY

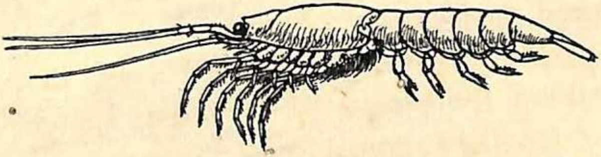
the harpoon gunner takes up his position on the gun platform and signals to the steersman which way to steer the ship. At the right moment the gun is fired and the harpoon, with its long rope following it, speeds towards the whale. Skilled harpoon gunners hardly ever miss.

When a blue whale is dead it sinks, but it is hauled up again, and air is pumped into it to make it float on the surface of the water. A tall pole with a flag flying from it is then stuck in the dead whale's back to mark where it is. Then the whale-catcher goes on in search of more whales, and another ship comes and collects the dead whale and tows it in to the factory ship. All the ships have wireless, so they can tell each other when a whale has been caught and where it is to be found.

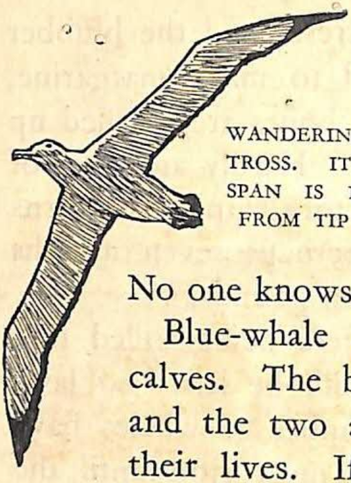
When a dead whale has been towed to the factory ship, the men on the factory ship haul it on deck up a wide, sloping slipway running from the deck to the water. When it is on deck they cut it up. Its flesh is stowed in enormous refrigerators to keep it fresh, and the blubber is melted down into oil and used to make margarine, soap, and many other things. The bones are crushed up and used as a manure on the land. Hardly any part of the whale is wasted. When the factory ship at last turns for home after being at sea for perhaps seven months she may carry a cargo worth a million pounds.

At one time so many whales were being killed that there was a danger that none would be left. So laws were made that after a certain number of whales have been killed each year, all hunting must stop until the following year. The laws also forbid hunters to kill whales that are not full-grown and ones that have young babies. Also certain parts of the ocean are set aside in which no whales may be hunted. In spite of those laws, however, there are not as many blue whales as there used to be.

A female whale has one baby at a time, or occasionally two. She has a baby, called a calf, every other year. A new-born blue whale is about 24 feet long, and it



ONE OF THE SMALL CREATURES THAT MAKE UP 'KRILL', THE FOOD OF THE BLUE WHALE (ACTUAL SIZE)

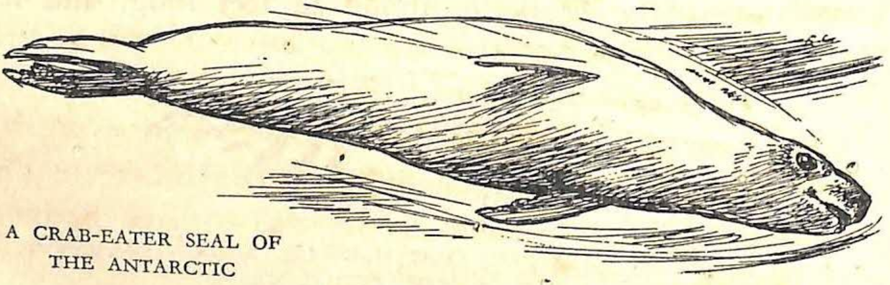


WANDERING ALBATROSS. ITS WING SPAN IS 12 FEET FROM TIP TO TIP

grows very quickly. It stays with its mother about seven months and then begins to live alone. It is not full grown until it is about twelve years old. No one knows how long a whale lives.

Blue-whale cows are very devoted to their calves. The bulls usually have only one mate, and the two animals probably stay together all their lives. If one is wounded the other will stay beside it, and so it often happens that they are both killed at the same time. They do not gather together in large numbers, but wander about in pairs, or alone, searching out those places where their food is most plentiful.

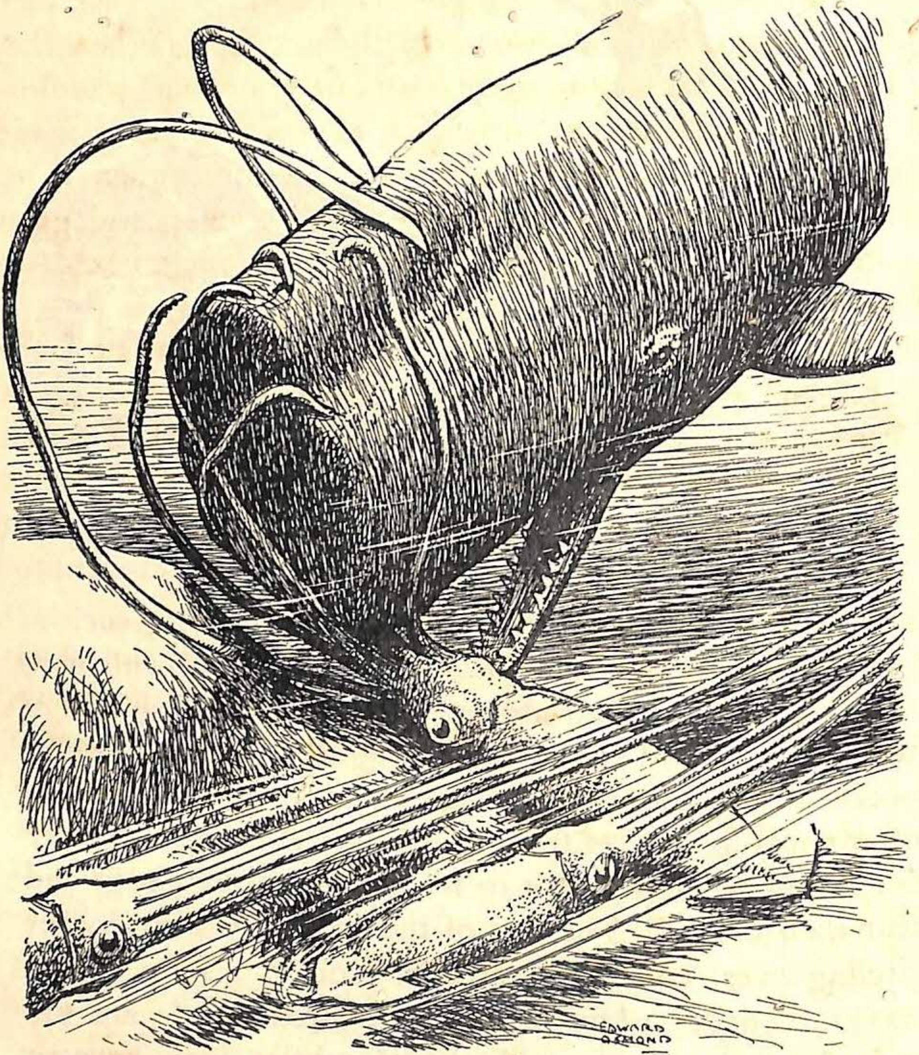
The small, shrimp-like creatures, called krill, on which the blue whale feeds, are also the food of many kinds of fish, as well as of seals and sea-birds. There are many



A CRAB-EATER SEAL OF THE ANTARCTIC

A GENTOO PENGUIN WITH ITS CHICK

kinds of sea-bird in the far south of the world, such as giant petrels and whalebirds, which swoop down on to their prey from the air above. The most striking bird of the southern seas is the wandering albatross, the largest ocean bird in the world, with long, narrow wings which often measure 12 feet from tip to tip. Albatrosses hardly ever come to land except to lay and hatch their eggs and rear their chicks. The rest of the time they spend either circling over the sea in search of food or resting on the waves. The best-known of all Antarctic birds are the penguins. As the front limbs of whales have become adapted for swimming instead of walking, so have the

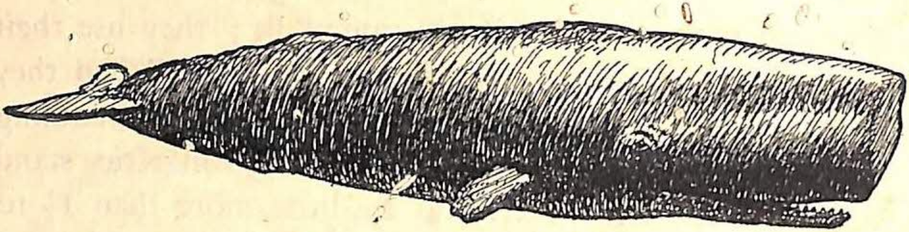


A SPERM WHALE ATTACKING GIANT SQUIDS

wings of penguins. Penguins cannot fly; they use their little wings as paddles to help them swim. When they are on land they stand upright and have a quaint waddling walk. The Emperor penguins of the Antarctic stand nearly $3\frac{1}{2}$ feet high, but some are little more than $1\frac{1}{2}$ to 2 feet high. They generally live in colonies, and great numbers of them breed together on the lonely islands in the Southern Seas.

The Greenland whales and the blue whales are both 'baleen whales', that is, they have baleen instead of teeth. Now we will describe some of the whales which have teeth. The largest of the toothed whales is the sperm whale, which is as large as the Greenland whale. Sperm whales usually live in the warm seas and feed on warmth-loving animals, especially squids.

Most kinds of squids are fairly large; the giant squid is very big indeed, and a fierce fighter. It has long, slender tentacles (like extremely long arms) with round suckers at the ends with which it clutches its prey. It feeds mostly on small fish, such as mackerel. From the tip of its torpedo-shaped body to the end of its tentacles it may be as long as 40 feet. It is able to move backwards very quickly, like a jet-propelled engine, by squirting water out of its body. When a sperm whale attacks a squid there is often a fierce battle. The whale holds the slippery, squirming squid with the great teeth of its



A SPERM WHALE

narrow lower jaw, which fit into sockets in its upper jaw. The squid attacks with its tentacles, making wounds on and round the whale's head.

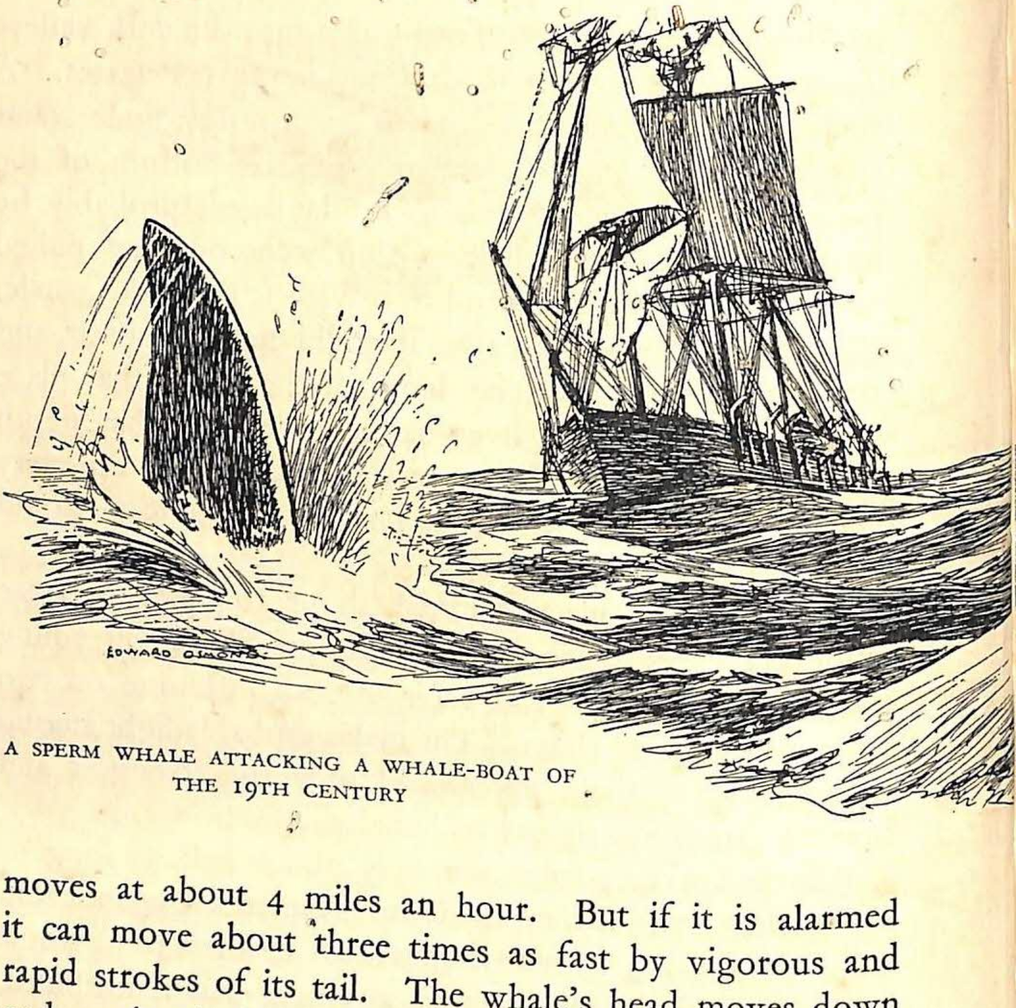
Sperm whales have large, squared-off fronts to their heads, and in the front part of their heads they carry a store of a pure kind of oil called ' spermaceti '. A large whale may have as much as a ton of this oil in its head. Spermaceti oil, which becomes solid when it is taken out of the whale, is very valuable to man. It used to be used in lamps among other purposes, and to-day it is used for making candles and medicines, and it is especially good for oiling typewriters and sewing-machines.

We do not know what use this spermaceti is to the whale, but we think it probably helps it to adjust to the changing pressure of the water when it dives down to a great depth below the surface. If a man dives down to more than about 60 feet below the surface the pressure of the water begins to become too great for him to bear. But a sperm whale sometimes goes down at least twenty-five times as deep as that, deep down into the dark valleys of the ocean floor where daylight never penetrates. A whale once got itself tangled up in a heavy underwater telegraph cable which was lying on the bottom of the sea. When this was found to be damaged, probably by the struggles of the whale, a ship went out and pulled it up to the surface to mend it. With it came the whale, which had drowned because it could not free itself and come up to breathe. The depth of the sea at that place was found to be well over half a mile. At that depth the water would have been pressing very heavily on every inch of the whale's body, so heavily that a man would have been crushed to death.

Sperm whales usually move about together in large numbers, called 'schools', made up either of young males or of females and their calves, with one or two large males among them. The males probably fight among themselves for their wives, and only the strongest and bravest can win a school of females.

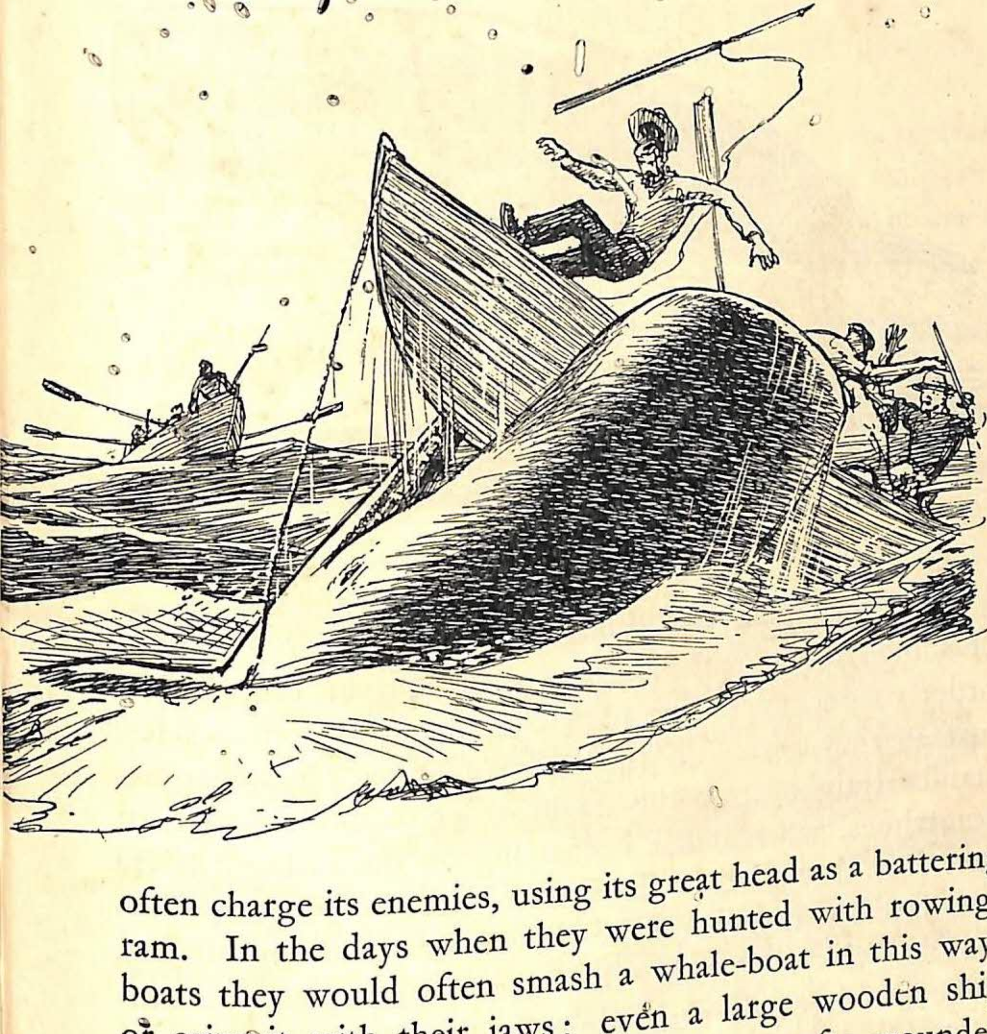
Female sperm whales are only about half as long as the males, and are much more slender in proportion. Like all whales, they are devoted mothers; a whole school will risk their lives to stay near a wounded calf, and the grown-up females are just as loyal to each other. The calves are about 13 feet long when they are born.

A sperm whale swimming along in a leisurely way

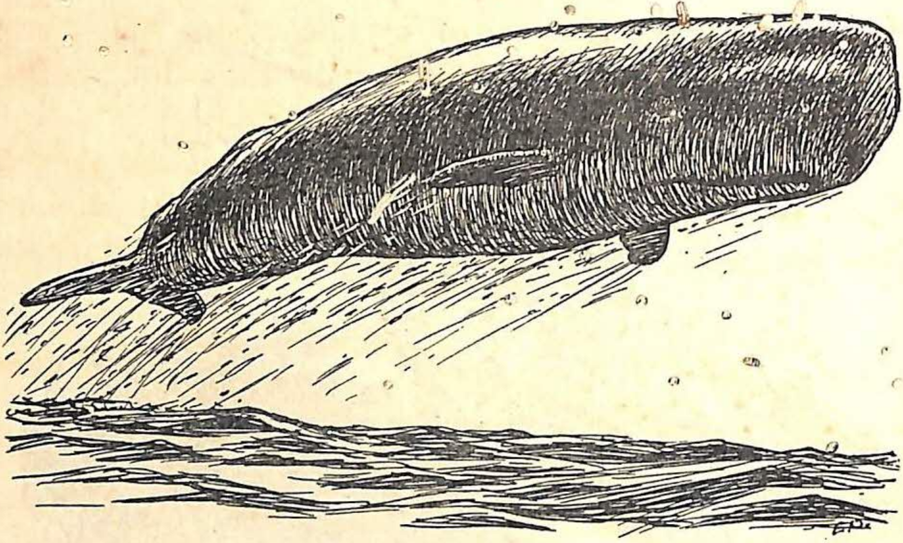


A SPERM WHALE ATTACKING A WHALE-BOAT OF THE 19TH CENTURY

moves at about 4 miles an hour. But if it is alarmed it can move about three times as fast by vigorous and rapid strokes of its tail. The whale's head moves down and up in rhythm with the up-and-down movement of the great flukes, and a wake of white foam trails far behind it. A sperm whale, especially if wounded, will



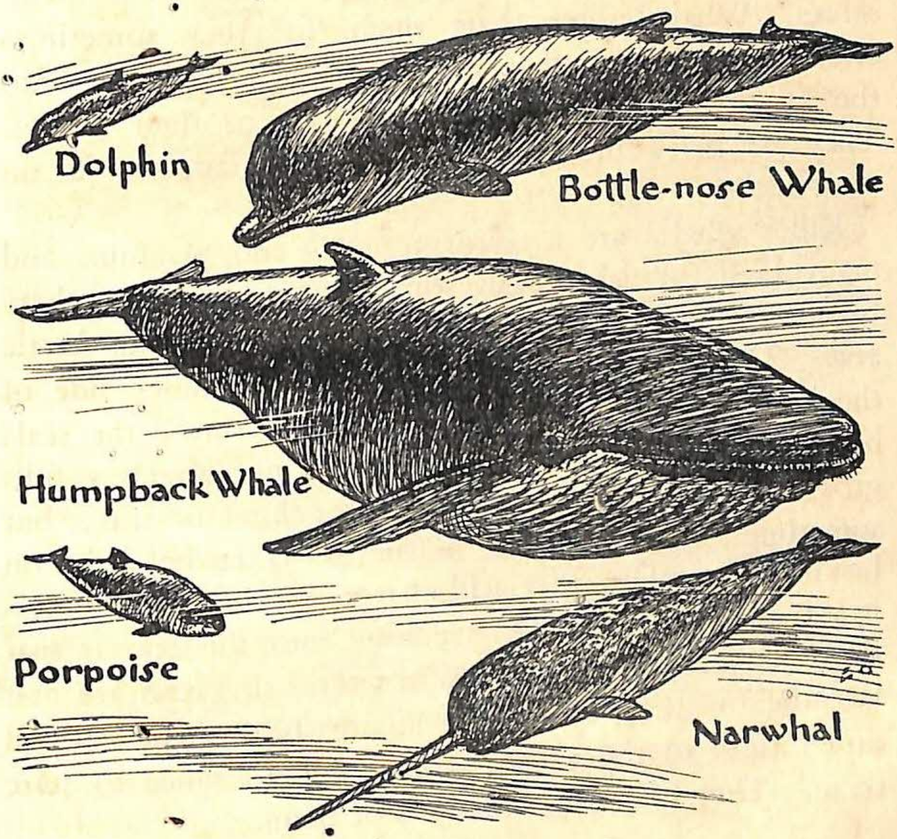
often charge its enemies, using its great head as a battering ram. In the days when they were hunted with rowing-boats they would often smash a whale-boat in this way, or seize it with their jaws; even a large wooden ship has been rammed and sunk by the charge of a wounded whale.



A SPERM WHALE LEAPING

A sperm whale sometimes leaps high out of the water, crashing down with an enormous splash, probably in order to get rid of the barnacles that grow on its sides, just as they grow on the hulls of ships. It sometimes stands straight up in the sea in order to look around, or sometimes, when it has been lying on the surface, it will just drop down below the surface without diving. When it is feeding, it stays on the surface for about ten minutes, during which time it takes about sixty great breaths. When it dives, it turns downwards till its flukes come high above the water, and then goes straight down. It may stay under the water for about three-quarters of an hour before coming up to breathe again, but sperm whales have been known to stay under for as long as one and three-quarter hours.

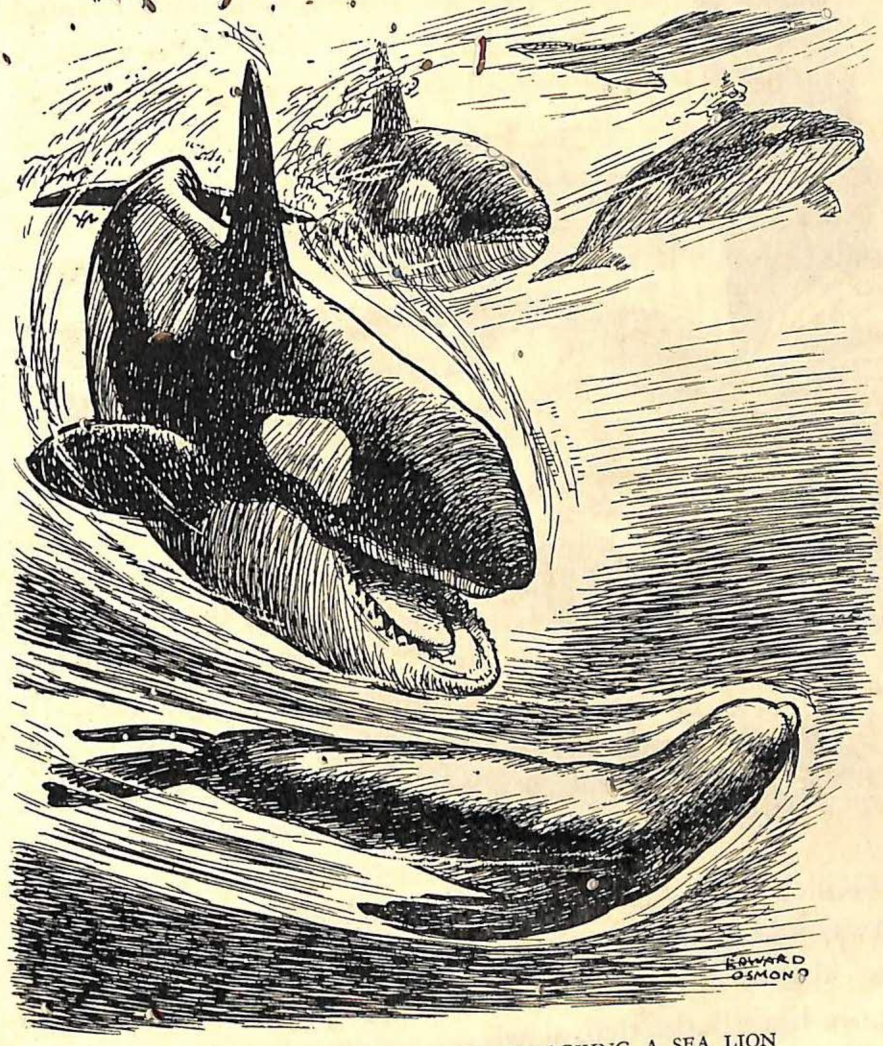
There are several other kinds of large whale, as well as many smaller members of the family, such as dolphins and porpoises. There are bottle-nose whales, humpback



whales, and narwhals—whales which have one long, spiral tusk, like the horn of a unicorn.

The most ferocious of all whales are the killer whales, which roam the seas in schools of from three to forty and hunt the creatures of the sea as wolves hunt on land. Although killer whales are seldom more than 30 feet long, they often kill whales much bigger than themselves. Whale-hunters hate them, for they sometimes attack dead whales that have not yet been taken into the factory ship, and tear lumps out of their bodies. They are black and white and have a triangular fin on their backs.

Killer whales are a terror to seals and penguins and many kinds of fish. Seals sometimes escape from them by scrambling up on to the ice that floats on the Arctic seas. Then the killer whales charge the under side of the ice to try to break it up and so to throw the seals back into the sea again. They dare not attack a full-grown walrus, which is a very large kind of seal; but sometimes when a mother walrus has taken her baby on her back for safety, they will charge into her from underneath and try to knock the baby into the sea so that they can seize and eat it. When the baby seals are first learning to swim, schools of killer whales swim up and down close to the shore, waiting for a chance to seize them. They often kill hundreds of them.



A SCHOOL OF KILLER WHALES ATTACKING A SEA LION

COMMON DOLPHINS GAMBOLLING IN FRONT OF A SHIP

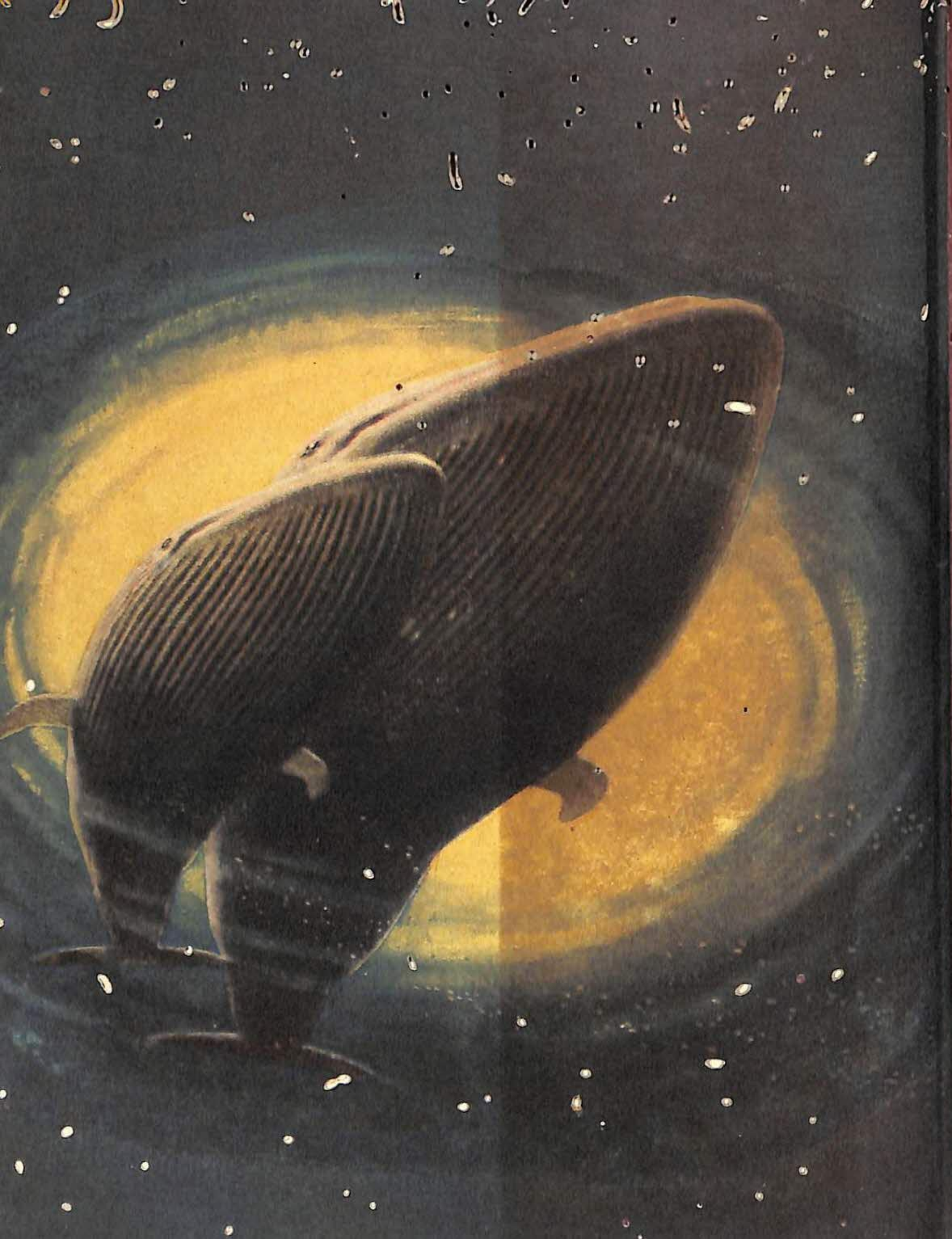
Killer whales have great teeth in both upper and lower jaws, which interlock as the jaws close. They seem to be always hungry, and their savageness makes them more like sharks than whales.

Dolphins and porpoises, the smallest kind of whales, are all of them harmless, and some even seem friendly towards men. They cause panic, however, among the fish that are their food. The common dolphin is a particular favourite. It is about 8½ feet long, and has a sharp beak. It travels in large schools in almost all the seas of the world except the very cold ones. Dolphins often keep ships company, swimming beside them or zigzagging just in front of them, even when the ships are travelling fast. Sometimes they leap out of the water and dive in again with hardly a splash, and at other times they fall back into the water sideways with a loud smack. Both they and porpoises sometimes swim up rivers and into harbours among the ships.

A dolphin who lived for about thirty-two years in a stretch of sea called Pelorus Sound near New Zealand became very famous. He became so well known that sailors gave him the name of 'Pelorus Jack', and always looked out for him when they passed that way. Pelorus Jack used always to escort ships through that bit of sea, and he became such a favourite that a law was passed that no one must kill or harm him.

Porpoises are much like dolphins, except that they are smaller—usually about 5 feet long. They also live in large schools, and they jump and tumble and play about in the water, usually not very far from the shore. They have often been seen playing near the British coast.

INSTITUTE OF EDUCATION FOR WOMEN
Dept. of Extension
SERVICE.
CALCUTTA-27



OXFORD
UNIVERSITY PRESS

LONDON — Amen House, E.C. 4
GLASGOW — 58 Buchanan Street
NEW YORK — 114 Fifth Avenue, N.Y. 11
TORONTO — 480 University Avenue
MELBOURNE — 346–348 Little Collins Street
WELLINGTON — Empire Building, Willis Street
BOMBAY — Apollo Bunder
CALCUTTA — Lal Bazar
MADRAS — Mount Road
KARACHI — McLeod Road
CAPE TOWN — 33 Waterkant Street
IBADAN — Iddo Gate

ANIMALS OF THE WORLD

BY EDWARD OSMOND

Series 1

ELEPHANTS CAMELS
POLAR BEARS CHIMPANZEES

Series 2

KANGAROOS REINDEER
BEAVERS WHALES

OXFORD UNIVERSITY
PRESS